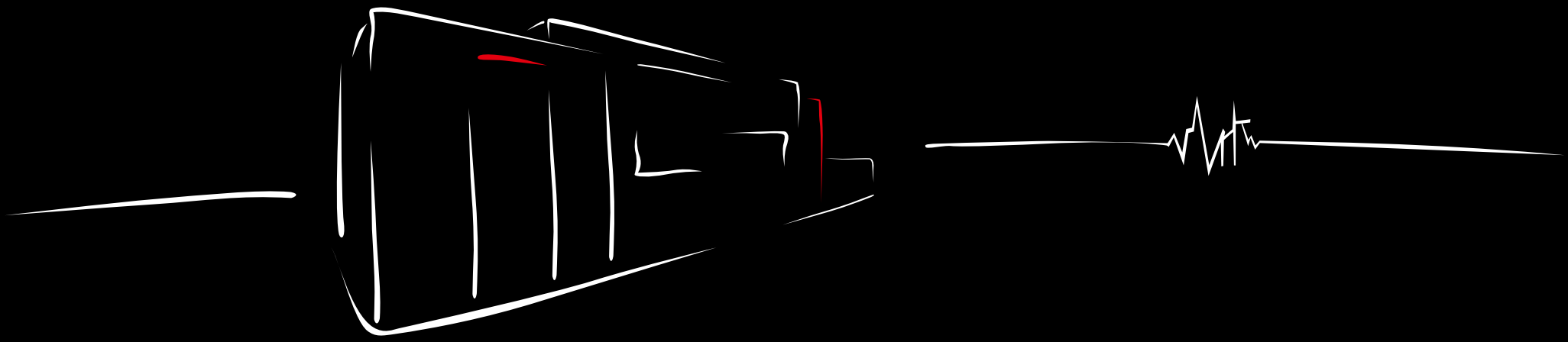
MITSUBISHI ELECTRIC

The Art of Economy

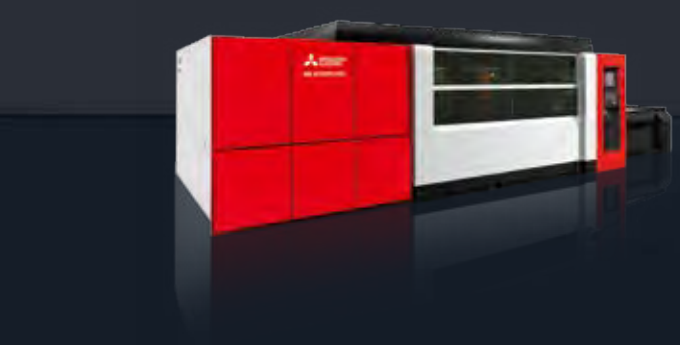


LASER CUTTING

# Fiber laser systems

For the ultimate boost to performance.

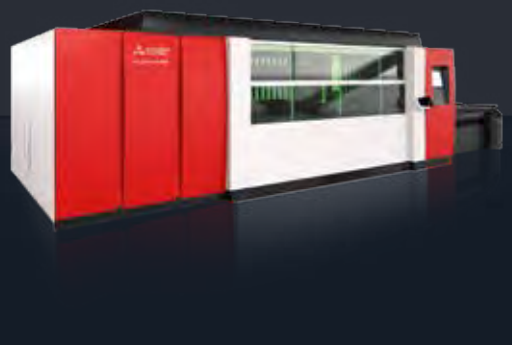
2/4 kW | 3050 x 1525 mm



## SR-F

For cost-effectively cutting thin sheet metal with maximum productivity

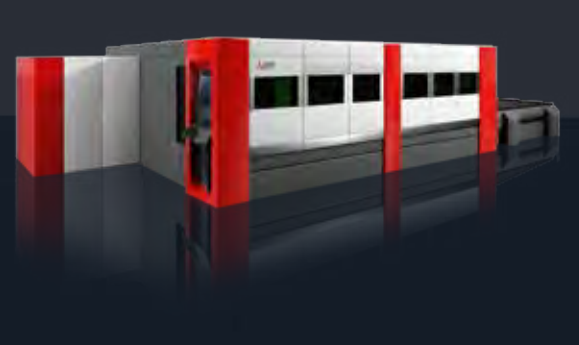
4/6/8 kW | 3050 x 1525 mm



## eX-F Plus

Flexibly through thick and thin with maximum productivity

4/6/8 kW | 4050 x 2060 mm



## RX-F

For flexibly cutting larger parts with maximum productivity

# Cross-Flow laser systems

Cutting quality has a name.

2.7 kW | 3050 x 1525 mm

## SR

For cost-effectively cutting thin sheet metal with superior cutting quality

4.5/6 kW | 3050 x 1525 mm

## eX Plus

Flexibly through thick and thin with superior cutting quality

4.5/6 kW | 4050 x 2060 mm

## RX

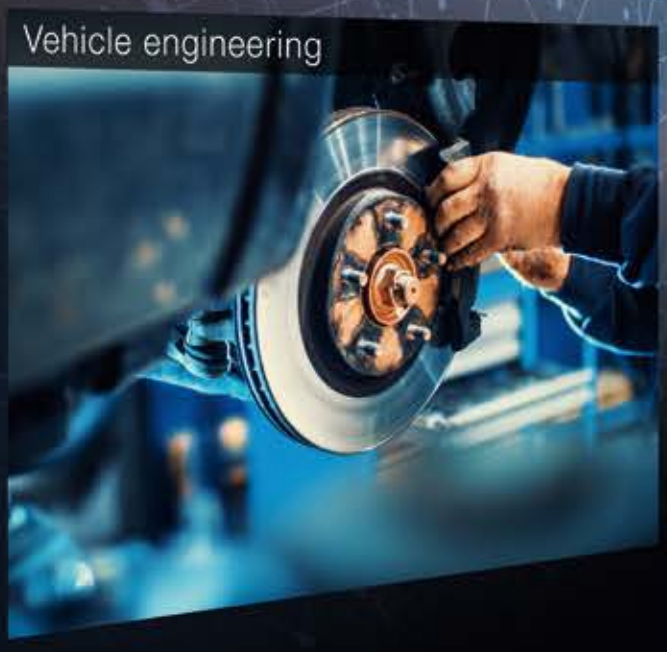
For flexibly cutting larger parts with superior cutting quality



Just the right system for me.







## Cost-effective and of high-value

Over 12,000 laser cutting systems supplied – experience from a global player. This also finds expression in the current models.

Development has been focused on high quality, high dynamic and availability, easy and advanced operation, and brilliantly conceived design.



*Many industries, always top results.*

**Over**

**8,000**
patent applications per year

**12,000**
laser systems to date

**139,000**
employees

**€35 billion**
annual sales

**95 years**
of reliable technology

Headquarters in Ratingen, Germany

# If you want to achieve big goals,

## you need a strong partner you can count on.


Companies worldwide rely on high-performance laser cutting systems from Mitsubishi Electric since 1982.

Only by developing and producing all the key components in-house can you tailor them to perfection. Mitsubishi Electric resorts to its own controls, motors, frequency inverters, relays and many other components that are adapted in every detail to the requirements. The only thing that you notice of it is that the machine is running smoothly – and often even for decades after purchase.

Anyone who wants a secure investment in a durable laser cutting system chooses **Mitsubishi Electric**.

Visit us at our new building in Ratingen where our wide-ranging products can be seen in action. Let yourself be excited by the “World of Mitsubishi Electric”!

# What does Mitsubishi Electric do?

## Paving the way to a secure technological future …

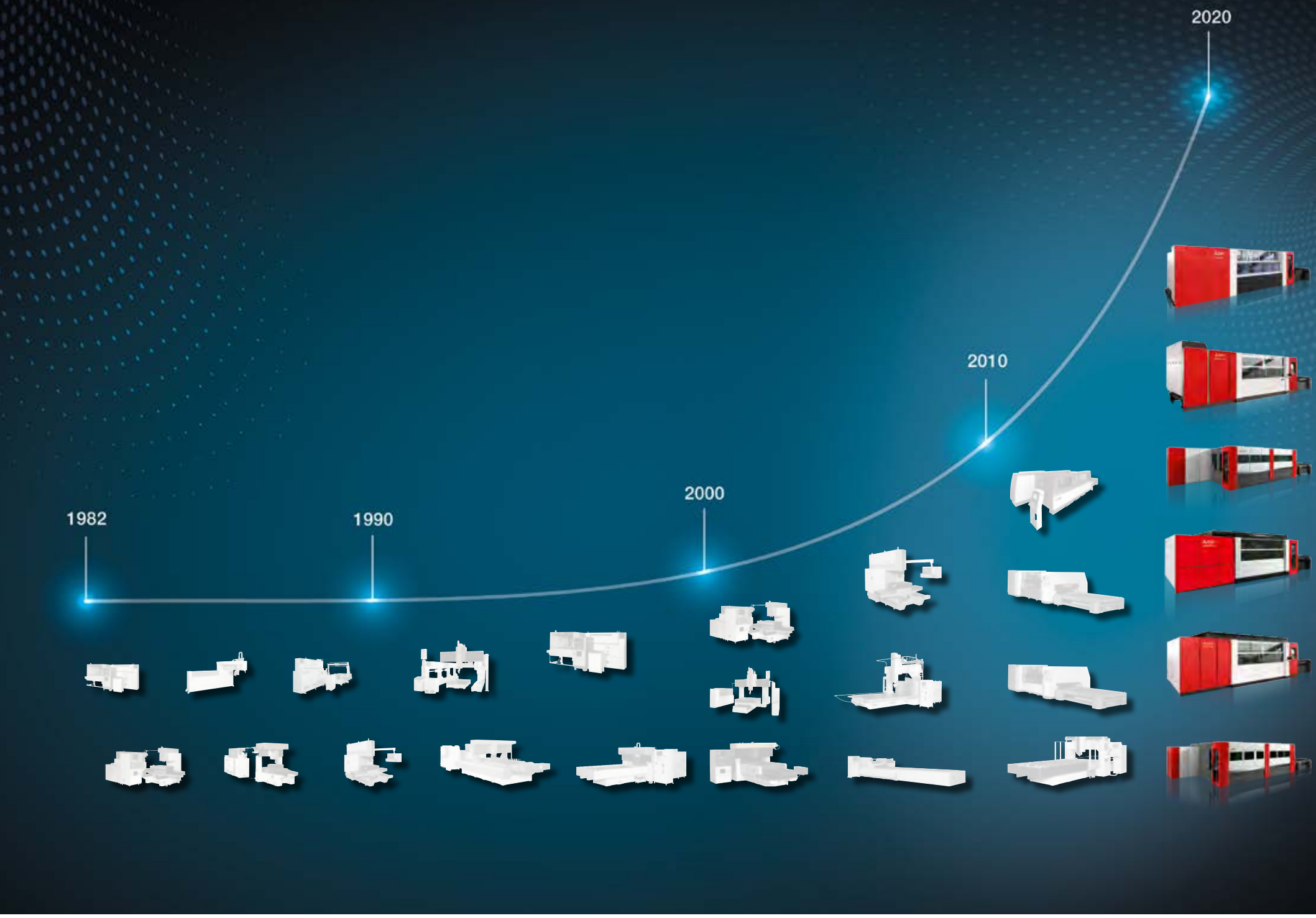
As a green technology corporation, Mitsubishi Electric and its 139,000-strong workforce manufacture electrical and electronic products and systems. The product range contains satellite systems, elevators, large video screens, industrial robots, electrical discharge machining (EDM) systems, CNC controls, air conditioning units, power semiconductors and much, much more besides. In demand worldwide, these products generate annual sales of US$37.8 billion.

Key components are produced in-house and tailored to the requirements of hypermodern laser cutting systems.

Galactic! Mitsubishi Electric has built “Michibiki 3”, its 39th satellite. The next one, “Michibiki 4”, will follow at the end of 2017 …

Guinness world record! Mitsubishi Electric supplies the world's fastest and hugest elevator.


Gigantic! Mitsubishi Electric installs the world's biggest ultra-HD video screen in New York's Times Square.




# 26 models since 1982.

An assurance of innovation and reliability.



Discover practical solutions
from Mitsubishi Electric!

Mark the important pages with
the handy index flags.



35 years of laser cutting systems – unsurpassed experience.


Watch film now:
**www.mitsubishi-laser.de/movie**

# Actually, Mitsubishi Electric

## only used to build laser cutting systems for itself …

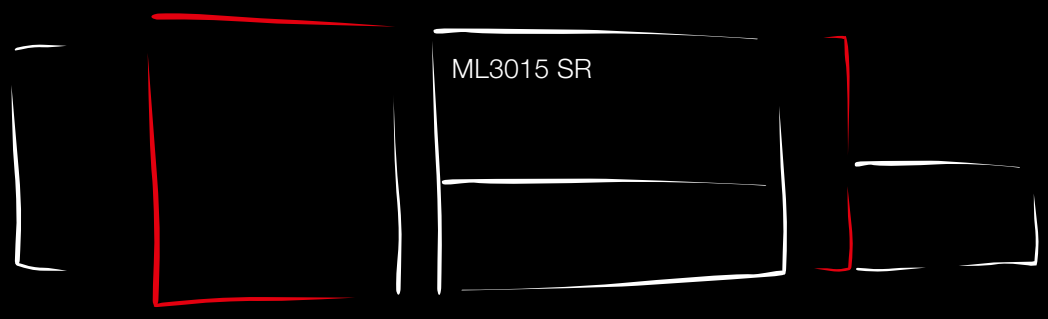
The requirements concerning the construction and installation of thousands of elevators are tough – particularly as far as the world's fastest elevator (built by Mitsubishi Electric) is concerned. To satisfy even the most exacting customer requests, you need laser cutting systems featuring high productivity and high cutting quality. At the beginning of the Eighties, however, none of the laser cutting systems available on the market satisfied these criteria. But since Mitsubishi Electric additionally supplies electrical discharge machining (EDM) systems to many mould- and toolmakers, it is well aware of the level of precision expected in this industry – and consequently has extra-high expectations of its own laser cutting systems used for producing the sheet metal parts for its over 65,000 EDM systems.

**Laser cutting for satellites**
The toughest quality requirements were found in the space industry – for which 39 satellites orbiting the earth have so far been built. Precisely these quality parameters have gone into the development of Mitsubishi Electric laser cutting systems over the decades.

**Why Mitsubishi Electric?**
We don't know if this development path has protected our customers from "prototypes" or if the exceptional quality of cut was the reason for the growth in popularity of Mitsubishi Electric laser cutting systems. It may also be that they are less likely to require servicing or that edges have to be reworked less often, which means extra profits for their owners. But one thing is certain: all companies that decide in favour of one of these laser cutting systems can claim for every single sheet metal part: "*Cut on a Mitsubishi Electric!*"

**See the "Mitsubishi Electric difference" for yourself on site and how it really pays off for you – year after year.**

# Laser cutting systems

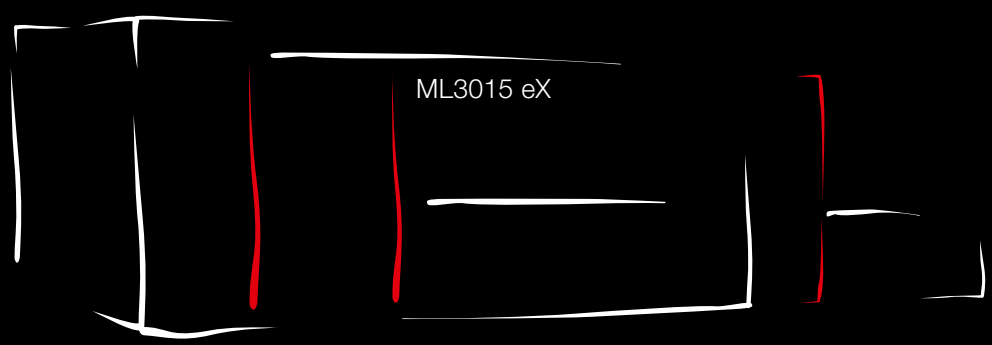


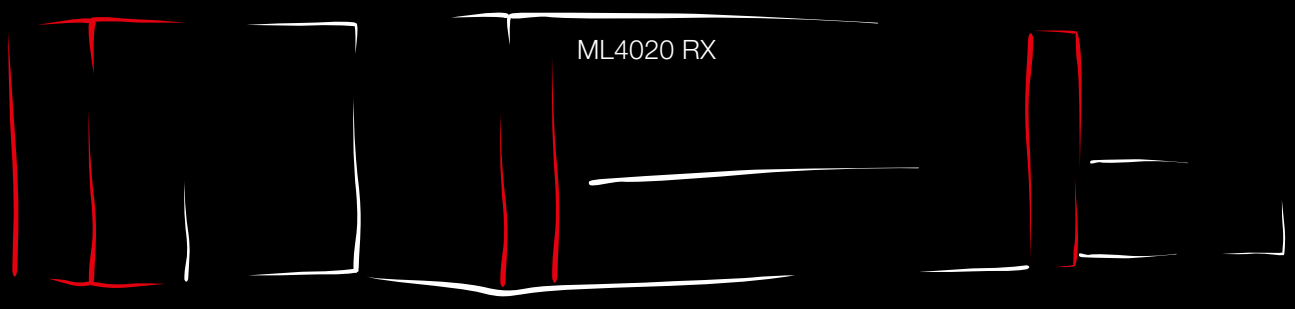

## For cost-effectively cutting thin sheet metal

ML3015 SR laser cutting systems permit cost-effective and high-quality laser processing focusing on thin sheet metal.

## Flexibly through thick and thin

ML3015 eX and ML4020 RX laser cutting systems permit top-quality laser processing – flexibly through thick and thin.






Economical and flexible!


**Full throttle?**
**No compromises!**

Watch film now:
**www.mitsubishi-laser.de/f-cut-en**

# The fast track for your laser

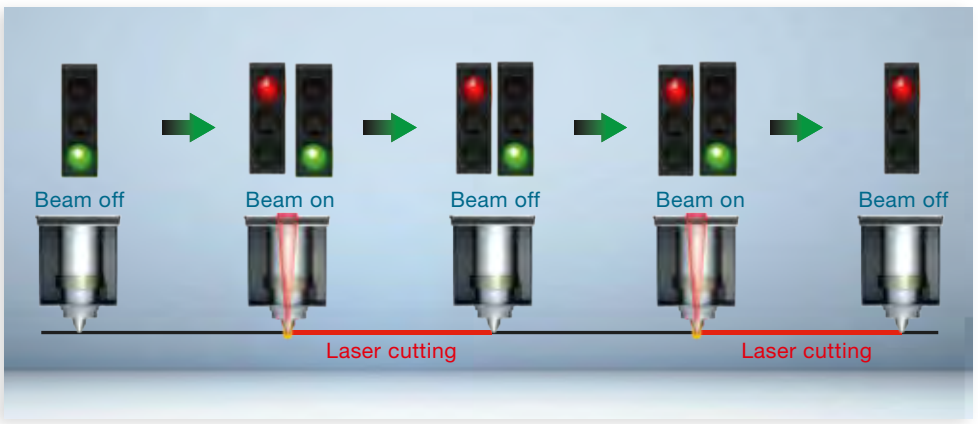
## is called F-CUT!

F-CUT – higher output with lower costs. Continuous movement of the processing head without stopping at the beginning or end of a contour – the laser beam is only switched on and off. This function is made possible by rapid direct communication between the laser control and axis control by MHC-L (*Mitsubishi Electric High-speed Controller for Lasers*).

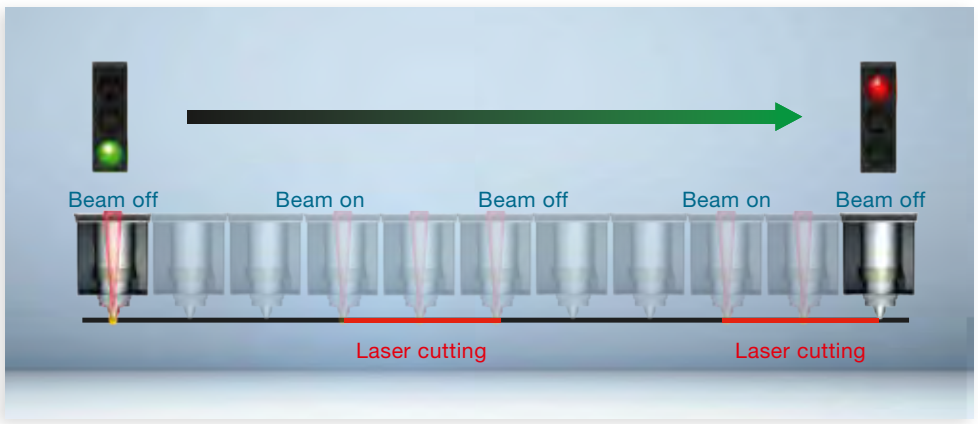
The laser beam can thus be activated or deactivated within a microsecond.

With F-CUT you achieve much faster processes (higher parts output) and hence reduced costs per part.

**Conventional**
The processing head stops briefly at the beginning and end of the contour.




**F-CUT**
Continuous processing without stopping the processing head






Continuous motion for high profits.

The in-built formula for short piercing times.

$$E = h \cdot f, p = \frac{h}{\lambda}, c = \lambda \cdot f, P = \frac{E}{t}$$

$$f = \frac{c}{\lambda} = \frac{3 \cdot 10^{8} m/s}{1,07 \cdot 10^{-6} m} = 2,8 \cdot 10^{14} s^{-1}$$

$$E = h \cdot f = 6,6 \cdot 10^{-34} Js \cdot 2,8 \cdot 10^{14} s^{-1} = 1,85 \cdot 10^{-19} J$$

$$p = \frac{h}{\lambda} = \frac{6,6 \cdot 10^{-34} Js}{1,07 \cdot 10^{-6} m} = 6,2 \cdot 10^{-28} Hy$$

Pulse energy 150J

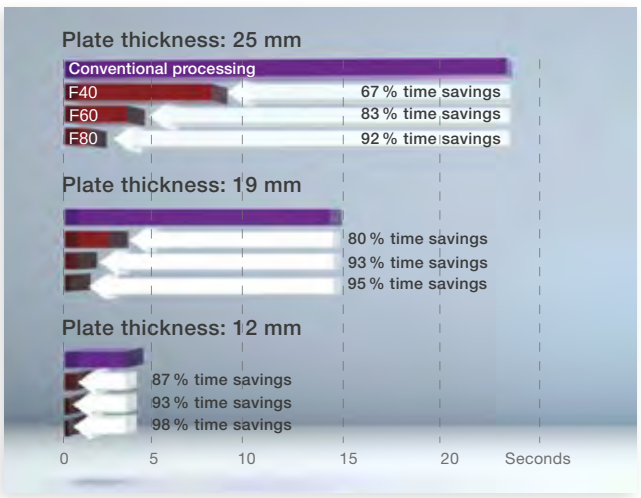
$$\frac{150 J}{1,85 \cdot 10^{-19} J} = 8,1 \cdot 10^{20} \text{ photons per pulse}$$

# Billions of extra photons.

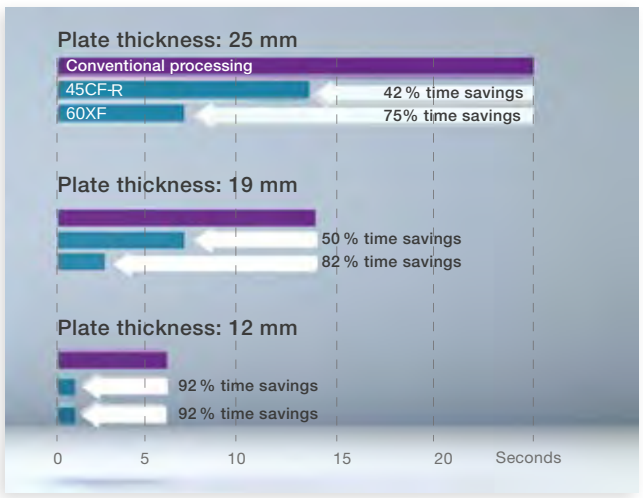
## Up to 98 % shorter piercing time for mild steel.

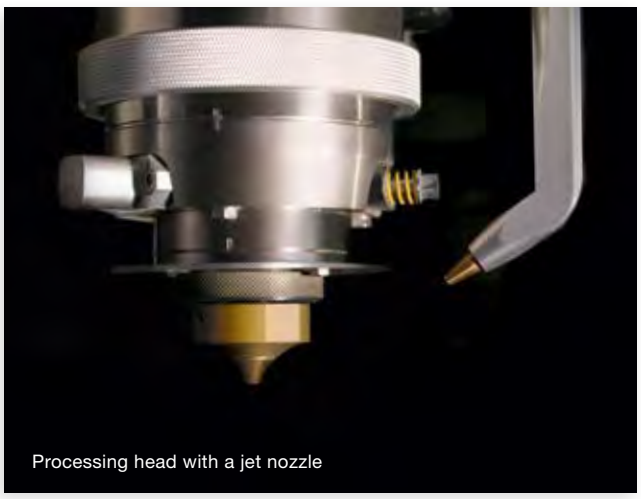
**Shorter piercing time for medium-thick and thick sheet metal**
Thanks to the skilful combination of high-energy pulse peaks and a jet nozzle, piercing times can be reduced by up to 98 %. In the last few years, the metal thickness suitable for high-peak piercing has increased from 8 to 25 mm.

**Fiber**

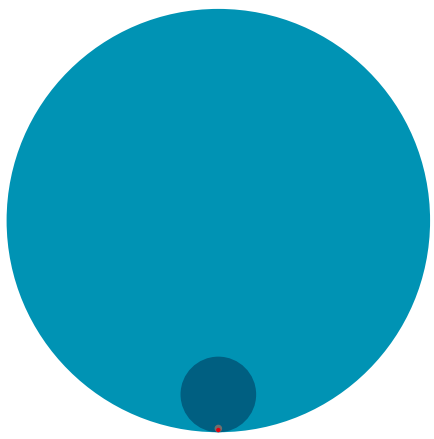



**Cross-Flow**





Processing head with a jet nozzle

## Comparison of particle sizes



Hair 70 µm

Dust 10 µm

Smoke 1 µm

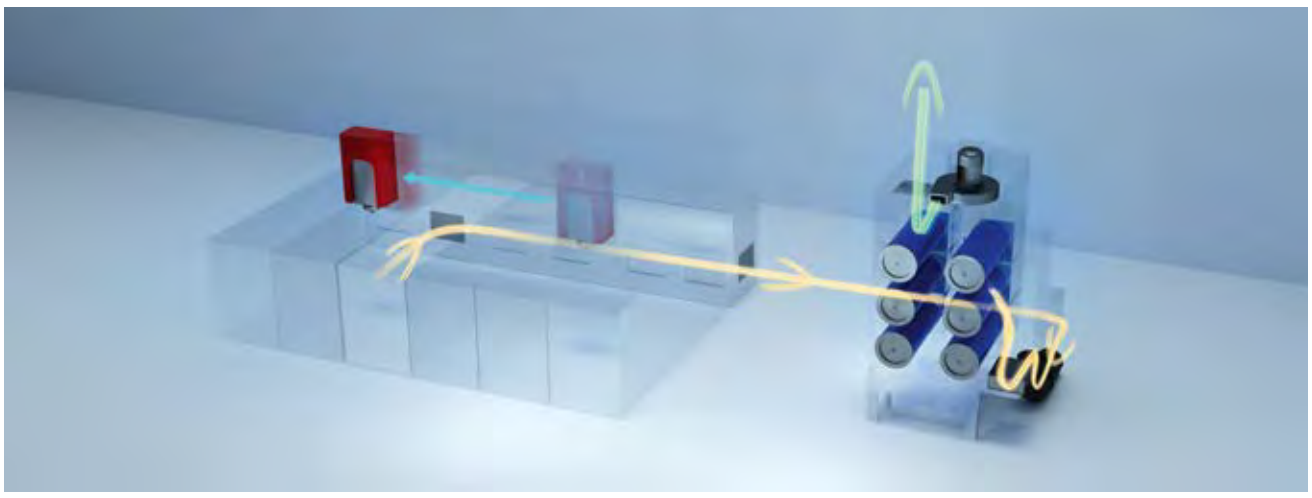
Filter performance of the exhaust system 0.5 µm

# Operator health and the environment benefit

from Mitsubishi Electric.

for a greener tomorrow eco Changes

**Better to exhaust fumes with targeted control of the individual area that really matters**
The fumes arising during the cutting process are exhausted reliably and, depending on the position of the processing head, locally and passed through a filter system with a purity rate of 99.999 % (minimum particle size 0.5 µm) – and with minimal maintenance effort. The outcome is clean air – safe for the operator and the environment.



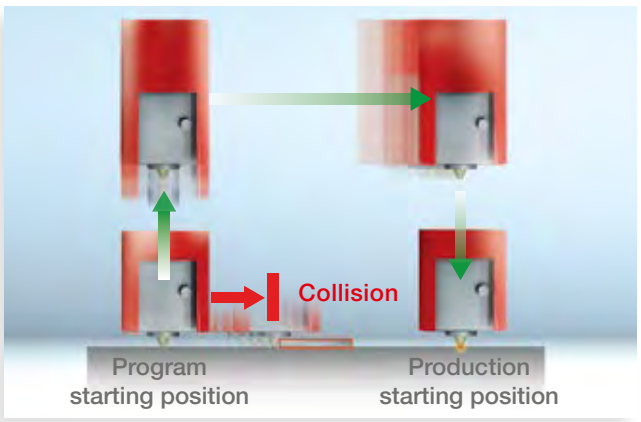
# 24-hour productive operation.

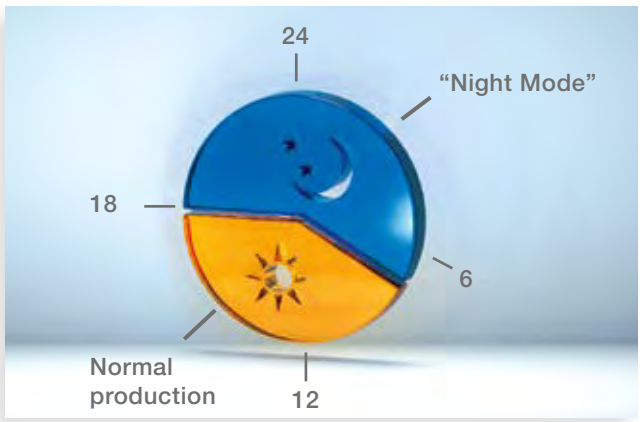
## Reliably and quietly at night.

**Preventing collisions: processing head retracts to prevent collisions**
At the start of every program, the Z axis rises into its topmost position before the processing head moves into its starting position. This reduces the collision risk and supports reliable operation – irrespective of the operator's level of knowledge.

**Safe night operation: the "Night Mode"**
Night Mode can be activated manually or automatically at a previously set time. The Night Mode adjusts the motion sequence of the processing head and slows down the pallet in- and outfeed. Night Mode thus reduces noise emissions and the risk of collision. This means less annoyance of the neighbourhood and less downtime.

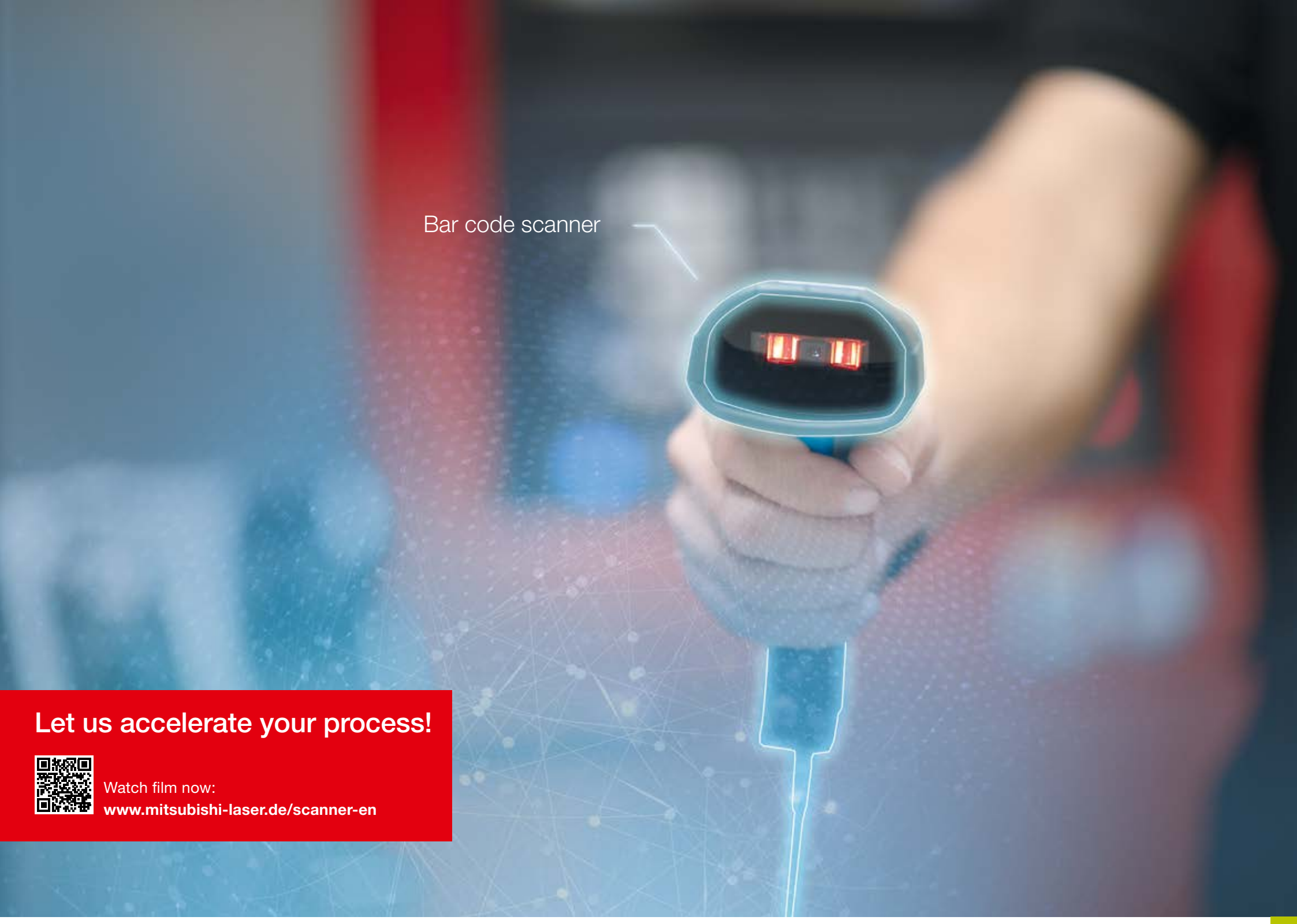
**In case anything should go wrong: there's still the magnetic damage reduction mechanism**
The processing head held magnetically in position can be returned to its original position within seconds after a collision. This not only minimises the risk of components being damaged in collisions, but also reduces the need to centre the nozzle after an unexpected contact.






I can make money while sleeping.




**Let us accelerate your process!**

Watch film now:
**www.mitsubishi-laser.de/scanner-en**

# Optimisation of unproductive times?

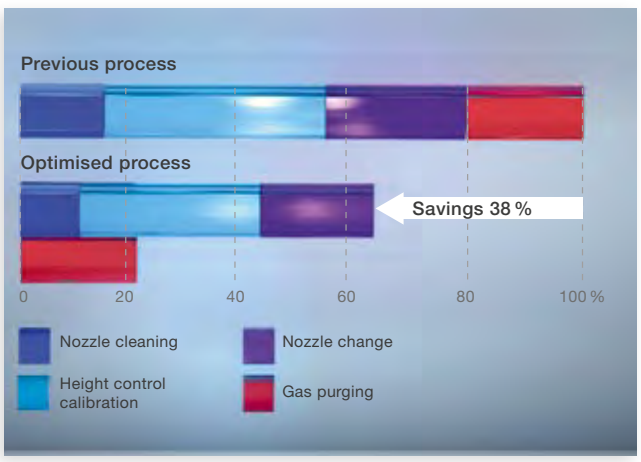
## A standard feature that pays off.

**2-step production**
1. Scan bar code
2. Press start
Action!

**Minimising set-up time**
Parallel is better than serial. Unproductive time is reduced with faster processes and processes taking place simultaneously. The outcome is higher parts output per hour.

**Step 1: Scan code**

**Step 2: Start process**






Brilliant systems for smooth-running processes.

# Not much experience with laser systems?

Don’t worry – it communicates with you.

**Superior cutting results**
Sometimes the finished cut isn’t quite the way you want it – maybe the edge is unusually rough or has burrs. For this there’s an integrated diagnosis menu with examples. After selecting the matching picture, the operator is advised on how to improve the result.

**Self-check**
All the chief components of the laser cutting system are constantly monitored. And all monitored parameters are neatly displayed on the main screen.

**Active control**
During the cutting process it is possible to steplessly adjust both the focus position and cutting speed.





*Learn quickly and get more out of your machine.*


# Built-in expertise.

## Giving you all the help you need.

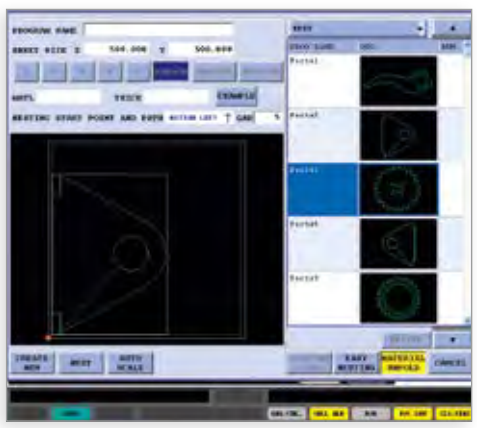
**Remaining time display**
Displays the time remaining until the end of the program. So you can see at any time when the cutting job is finished. This way everything runs smoothly.

**Time forecast**
Before the program starts, the time forecast indicates the expected processing time for the program. This way the operator can plan flexibly at all times.

**Rapid production of extra parts**
Should extra parts be needed at any time, these can be produced with just a few mouse-clicks at the control. Even simple nesting is possible.

**Convenient program modification**
Changing process conditions can be simply executed due to the individual contours being linked with the appropriate program blocks. By clicking on a contour, the relevant part of the program is automatically called up. This saves a lot of time!







# Laser technologies.

Speed, cutting quality and operating costs have to be accurately balanced if the investment is to pay off.

**Fiber technology**

Thin sheet metal can be cut particularly quickly with Fiber lasers. The short wavelength of 1.07 µm is excellently absorbed by metals and thus achieves outstanding efficiency. The energy input into the metal is higher than with $CO_2$ lasers, so the cutting speed is faster.

**Cross-Flow technology**

Burr-free cuts with low surface roughness are characteristic of Cross-Flow lasers. Because of the high surface quality, time-consuming and costly reworking is reduced significantly. Cross-Flow lasers have been in use in industry for many decades now. They are extremely robust, durable and low on maintenance.



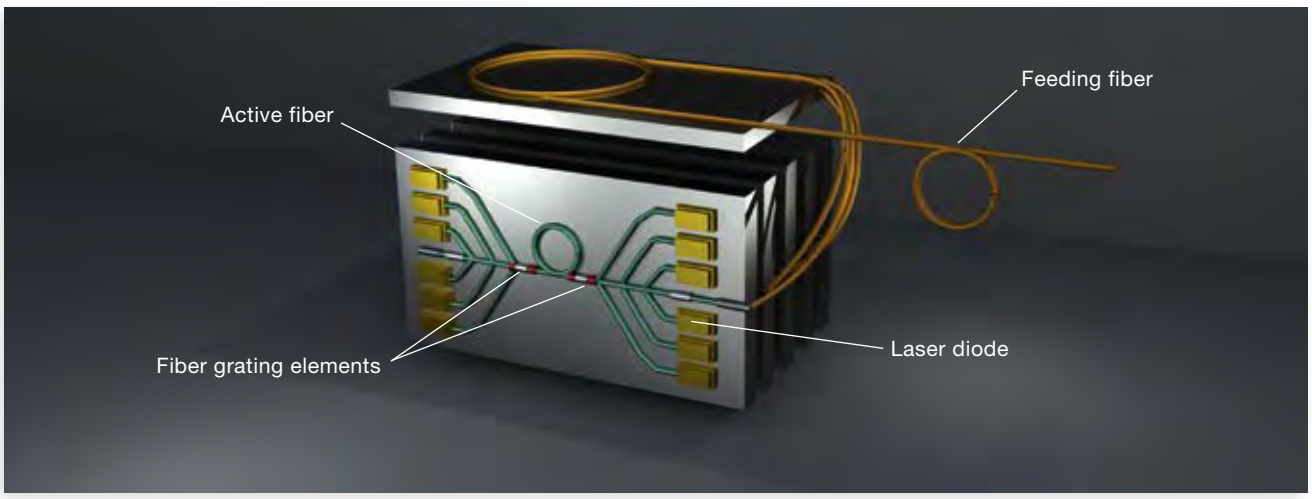
You can only give neutral advice if you've got different technologies to choose from.

**Uncompromisingly fast!**

# Fiber laser.

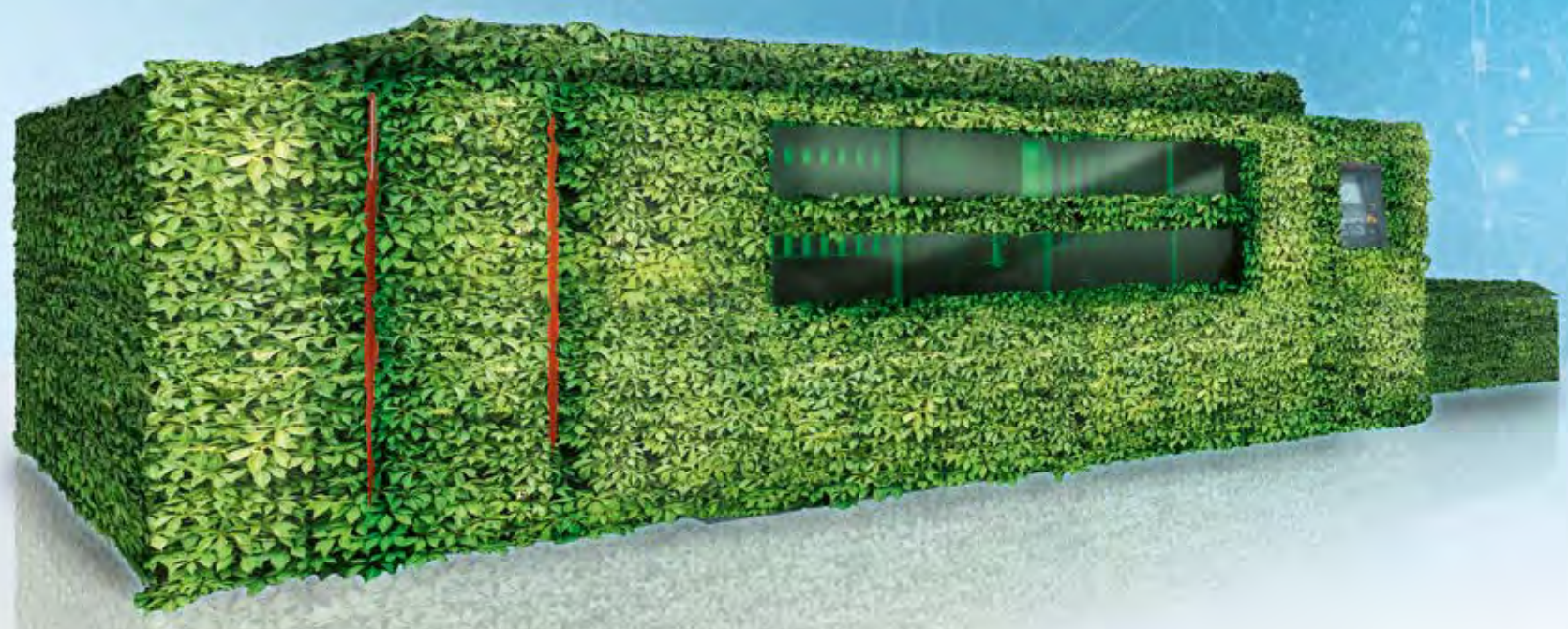
## Working principle.

High-performance fiber lasers have a modular design. In a Fiber laser module, a number of laser diodes “pump” the “active fiber” and thus generate a laser beam. Individual Fiber laser modules are grouped together and the combined laser beam is then guided via a flexible fiber optic cable – the feeding fiber – from the laser source to the processing head of the laser cutting system.






*Fastest in thin and medium-thick materials.*



for a greener tomorrow

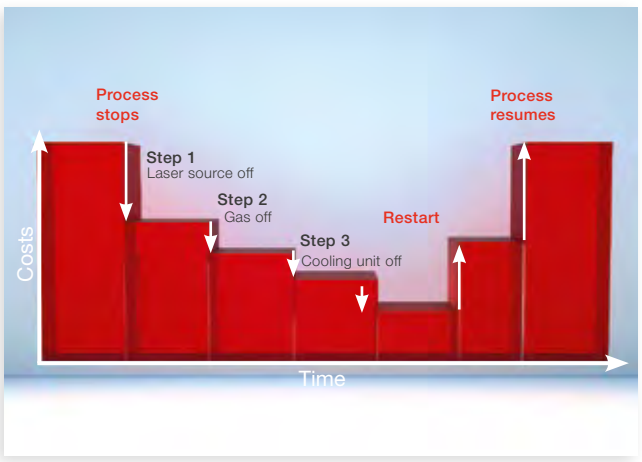
# Give your electricity meter a break.

## Up to 50 % efficiency!

**Miracle of efficiency**
Owing to the high conversion efficiency of the Fiber laser, you can slash your electricity bill. The energy efficiency achieves values of between 40 and 50 % – exceptional for laser technology.

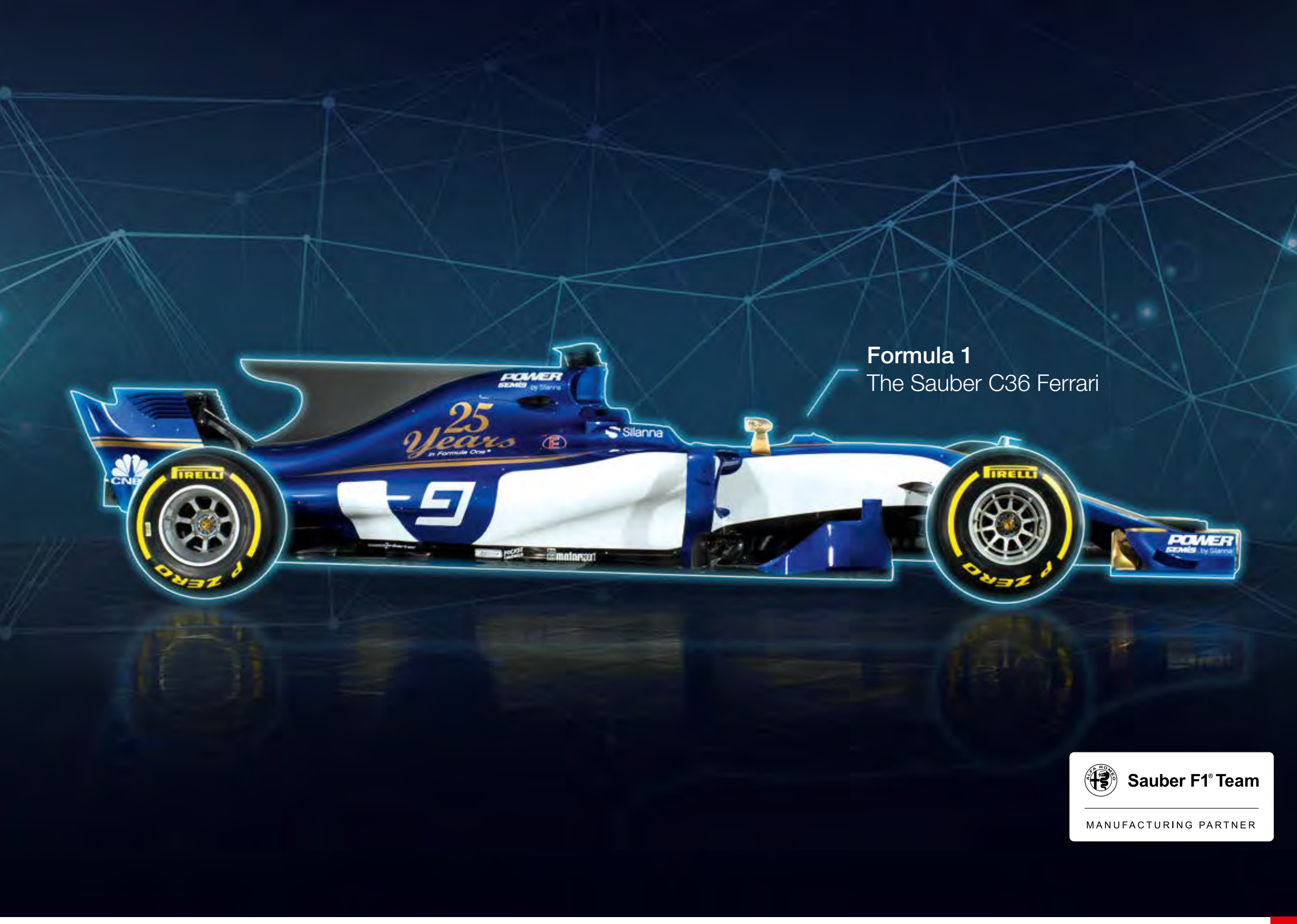
**Cutting operating costs with energy-saving control and drive units**
Energy savings have been achieved with perfectly matched Mitsubishi Electric control and drive units.

**ECO mode**
During idling, the intelligent ECO mode switches step-by-step into standby. In standby mode, costs can thus be cut by up to 70 %. Reactivation of the laser system takes approx. one minute.




Less electricity, lower costs.




**Formula 1**
The Sauber C36 Ferrari

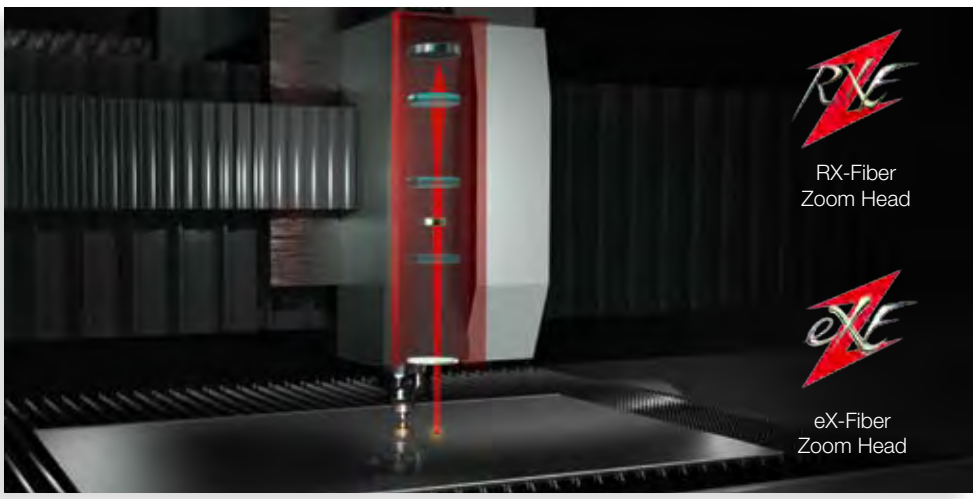
Sauber F1® Team
MANUFACTURING PARTNER

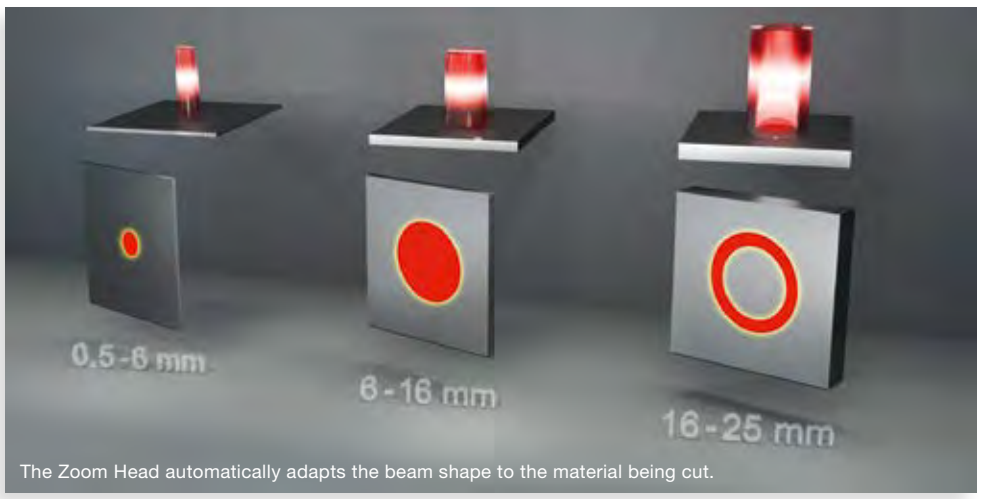
# From thin to thick and back again?

## Faster than a pit stop!

**The Zoom Head – adjustment in record time**
Anyone constantly switching between sheet material of different thicknesses wants to resume cutting as quickly as possible – and without compromising on cutting quality. The Zoom Head developed by Mitsubishi Electric delivers speed and flexibility – for many years to come.

The optics are hermetically sealed to protect them from contamination during the rough and tumble of everyday operations. The only thing you notice is that everything runs smoothly.



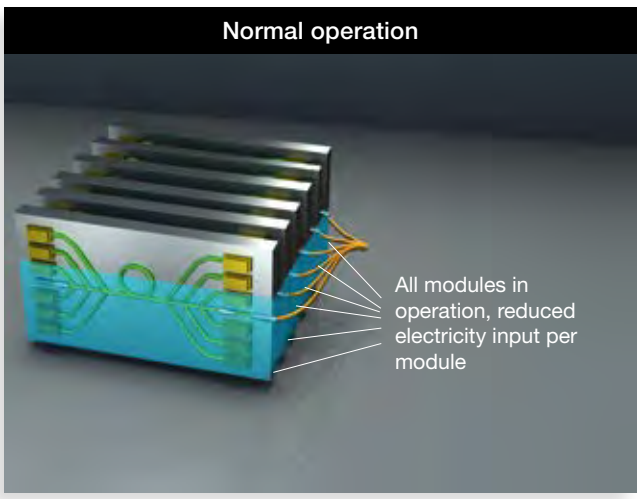



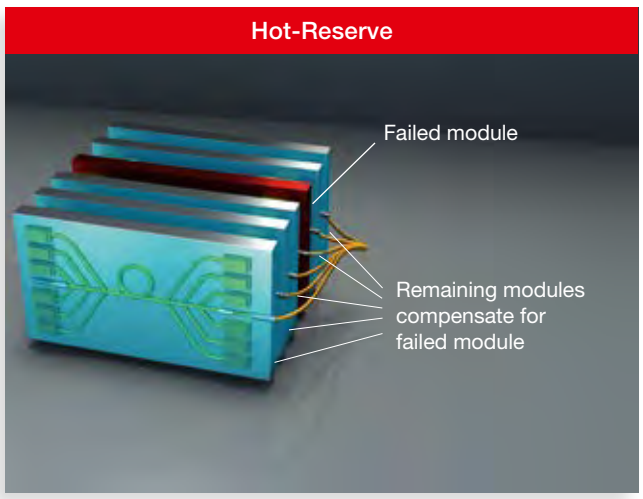
The Zoom Head automatically adapts the beam shape to the material being cut.

# Monitoring alone is not an assurance

of dependable production. But our Hot-Reserve is.

**Has a Fiber laser module failed? Has the machine stopped running? Not with the Hot-Reserve!**
In normal operation the laser modules are operated at up to 80 % of maximum possible power. Should a laser module ever fail, the nominal laser power can still be achieved by raising the power of the remaining modules accordingly.



## A strong workhorse.

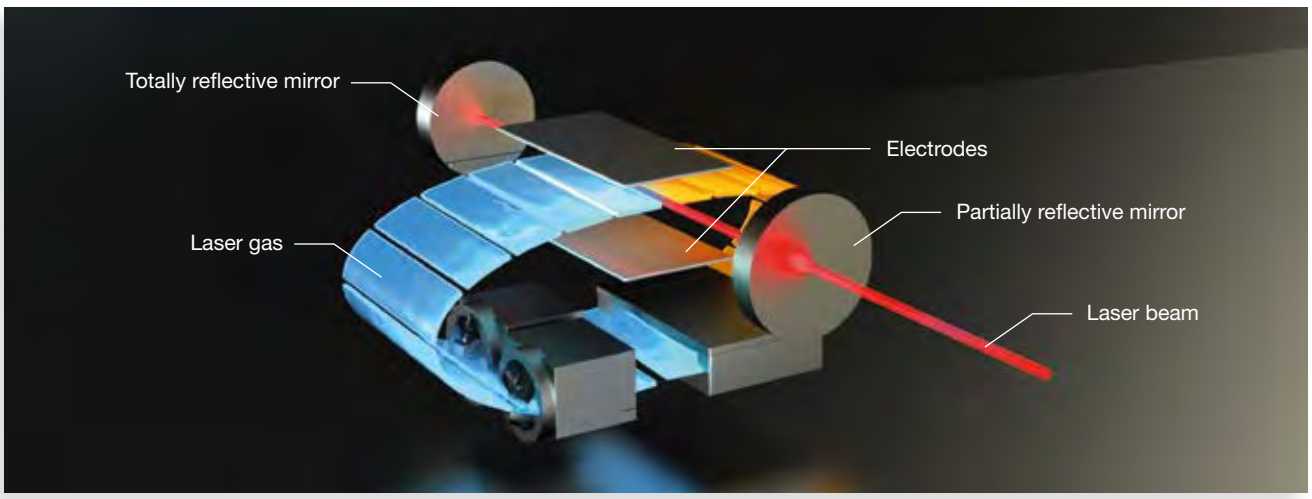
A laser system that delivers top performance, day in, day out – for decades.

Created for tough industrial operations where speed is of the essence and precise results with excellent edge quality are demanded.

# Cross-Flow.

## Working principle.

A gas mixture flowing slowly crosswise to the beam axis is stimulated by electrical discharges. With specially positioned mirrors, this process is intensified and a high-power laser beam is thus generated. This is guided via deflection mirrors from the laser source to the processing head of the laser cutting system.






*Superior surface quality with patented technology.*

# Costs of conventional $CO_2$ laser

**High maintenance costs**

- Electrode wear
- Glass tubes
- Many mirrors
- Gas turbine at over 700 km/h

**High laser gas consumption**

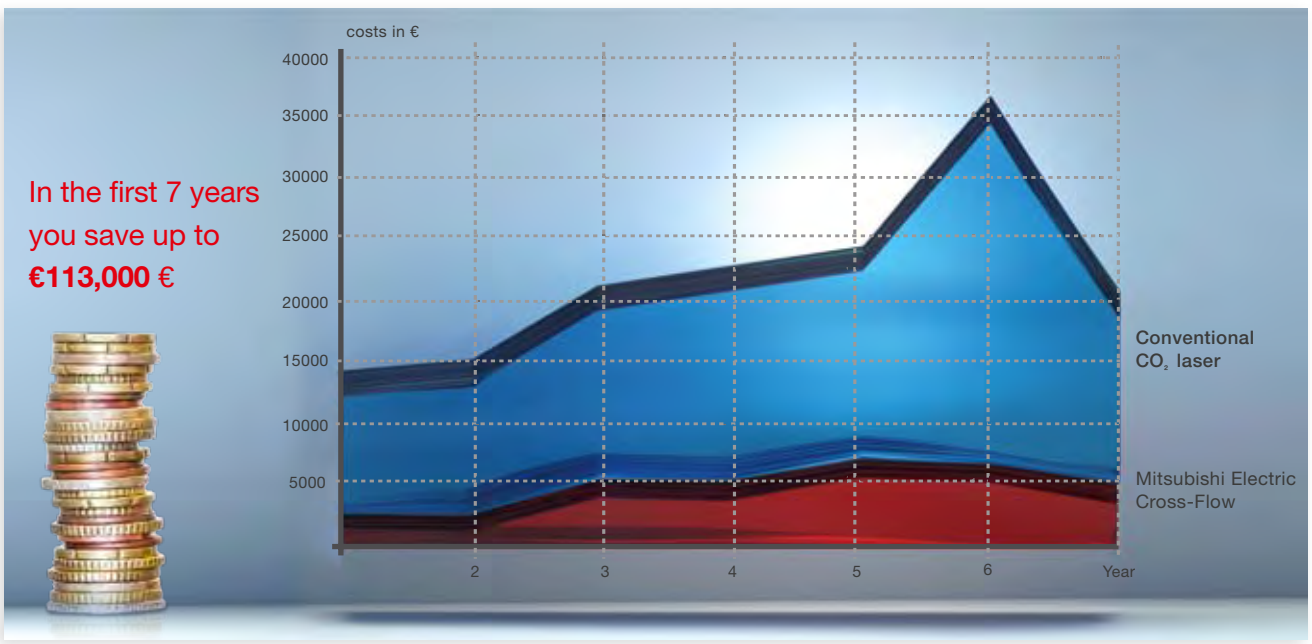
Conventional $CO_2$ laser systems are maintenance-intensive and expensive.

Cross-Flow

# Achieving more with less.

Cross-Flow scores with the components it does without.

**Cuts maintenance costs by up to 77 %**



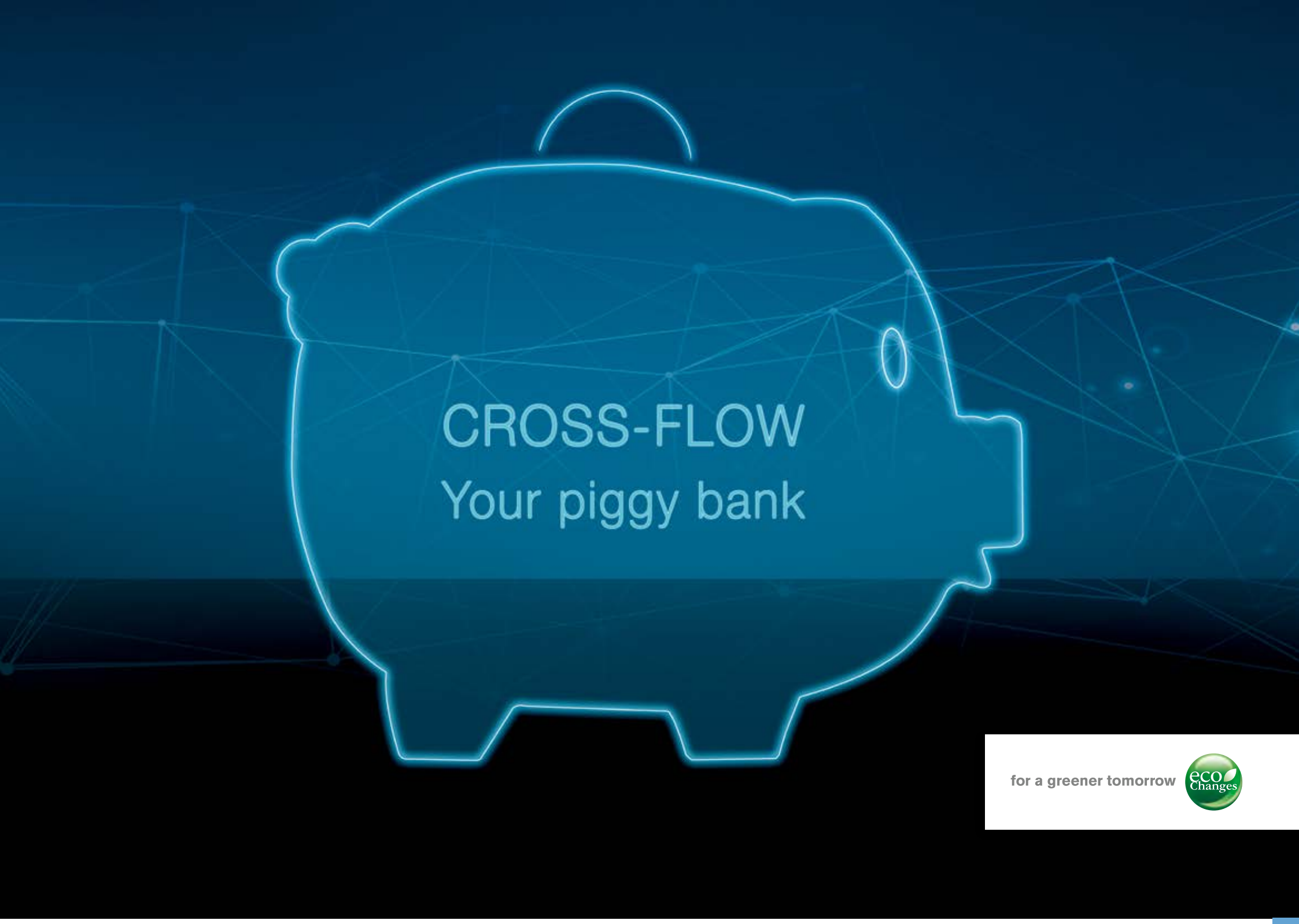

**Patented.**

The Cross-Flow resonator developed by Mitsubishi Electric needs maintenance less often than conventional $CO_2$ resonators. In addition, the resonator itself contains far fewer wear parts. As a result, maintenance costs are up to 77 % lower than for conventional $CO_2$ lasers.

Because of the gas-sealed resonator, the laser gas is replaced not continuously, but only once per day. This reduces laser gas consumption dramatically.



Oops! Nobody told me about that.




for a greener tomorrow eco Changes

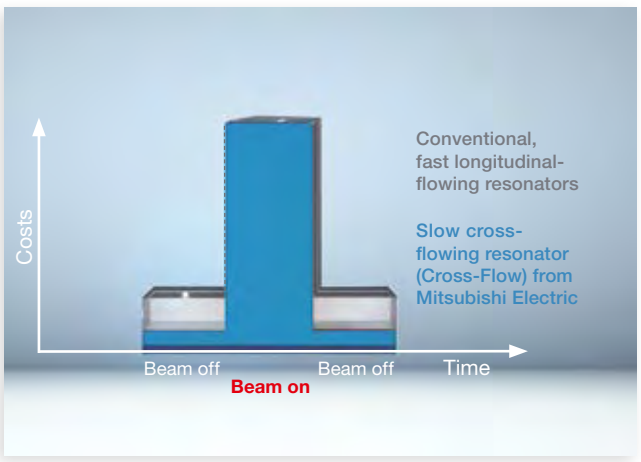
# Energy savings.

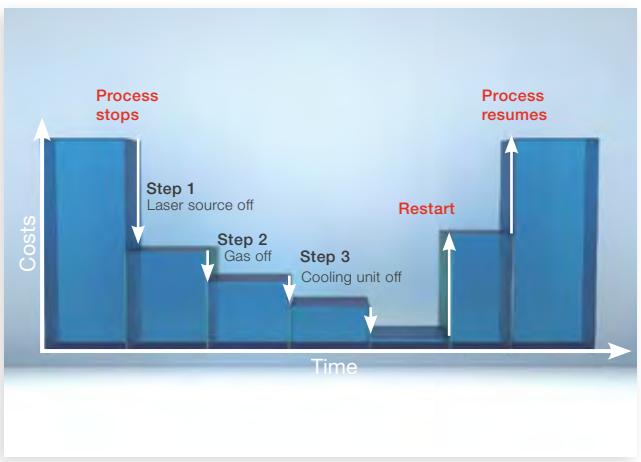
## Combines economy with top-quality cuts.

**Just-on-time discharge method**
The just-on-time discharge method reduces power consumption whenever the laser beam is switched off.

**Cutting operating costs with energy-saving control and drive units**
Energy savings have been achieved with perfectly matched Mitsubishi Electric control and drive units.

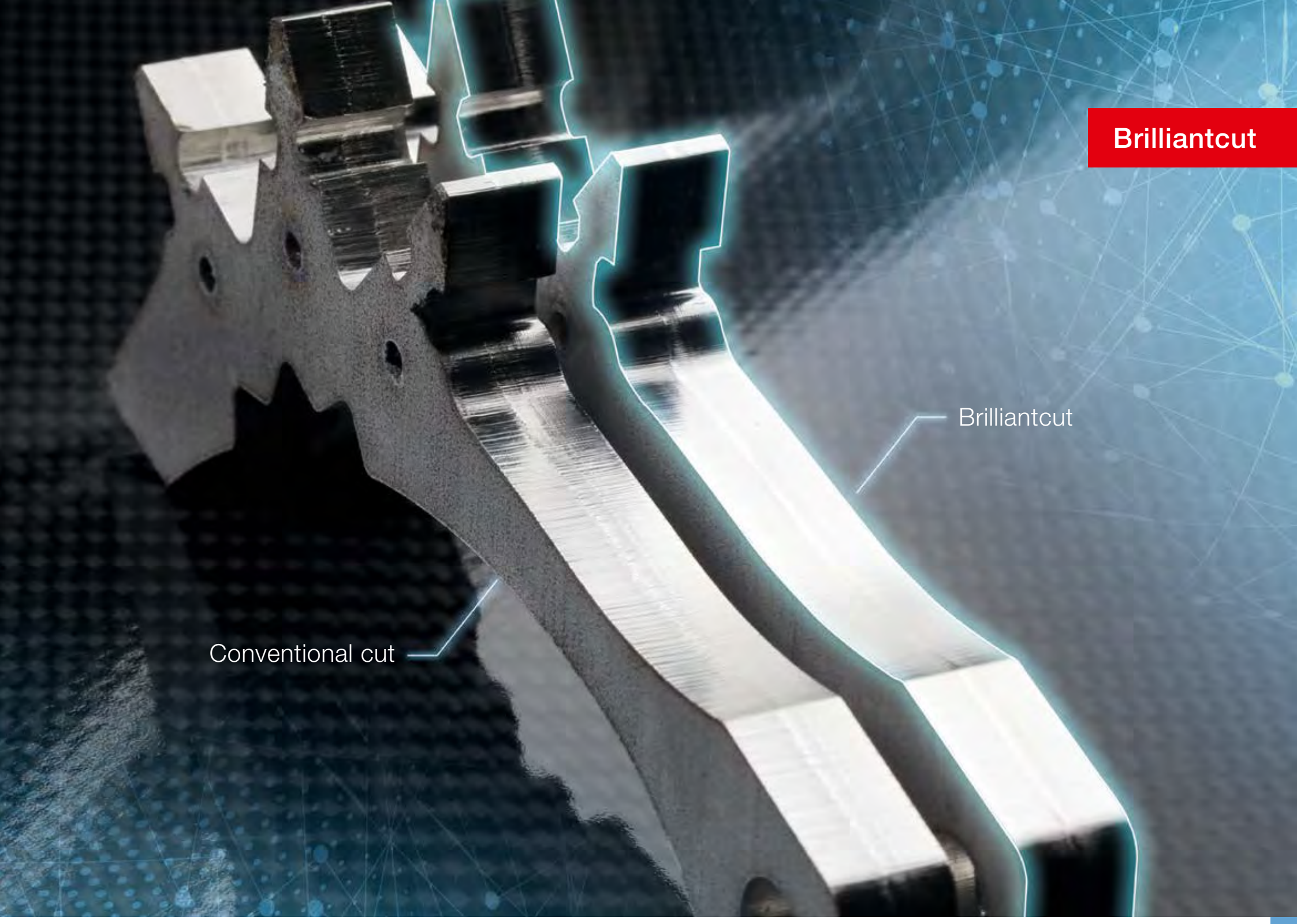
**ECO mode**
During idling, the intelligent ECO mode switches step-by-step into standby. In standby mode, costs can thus be cut by up to 99 %. Reactivation of the laser system takes no more than 3 minutes.





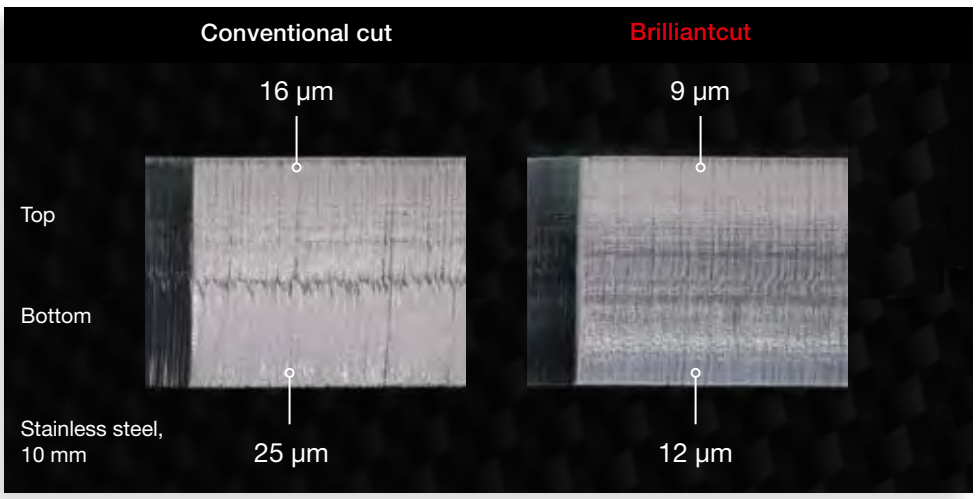

So that's how to save energy!




# A difference you can see and feel.

## But the biggest benefit of a clean cutting surface is the saving of reworking costs.

**Brilliantcut – 40 to 50 % improved surface quality!**
The slow cross-flowing laser gas and the resultant stable discharge of the Cross-Flow laser in combination with patented beam guidance permit surface finishes comparable to those from mechanical machining. This means reworking can often be eliminated or reduced to a minimum.






You can feel the difference!

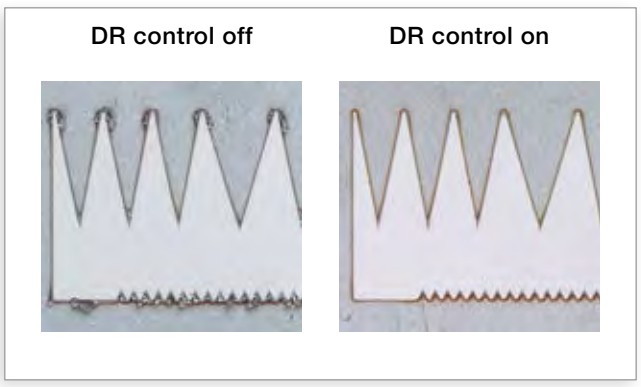

# Less reworking, higher profits.

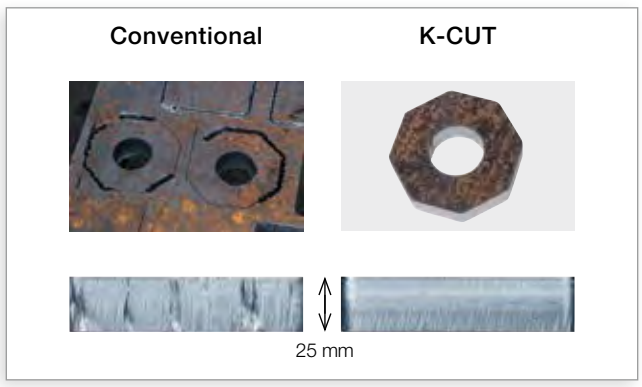
## Technologies for superior results in any material quality.

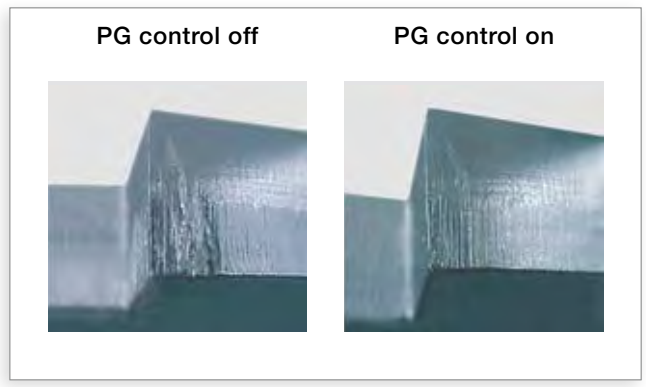
**Dross Reduction (DR) control**
During acceleration and deceleration in corners, the Dross Reduction control measures and controls laser power in relation to cutting feed. This reduces unwanted temperature effects on the underside of the sheet material and at the end of the cut. Burr formation on stainless steel and galvanised sheet materials is therefore reduced. This results in less reworking and hence in lower costs.

**K-CUT**
Not all sheet material is of the same quality. With K-CUT you can also cut lower-quality materials with good cutting results.

**Plasma-Guard**
For complicated geometries in thick stainless steel. The predictive adjustment of machine parameters on sharp corners prevents the development of plasma from the outset. This way you get sharp corners – even on thick stainless steel – entirely without burrs.






A clean cutting surface is the be all and end all.

High-speed power sensor

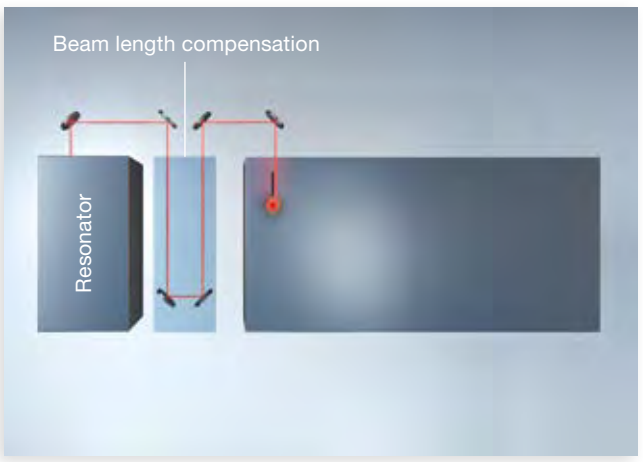
Patented

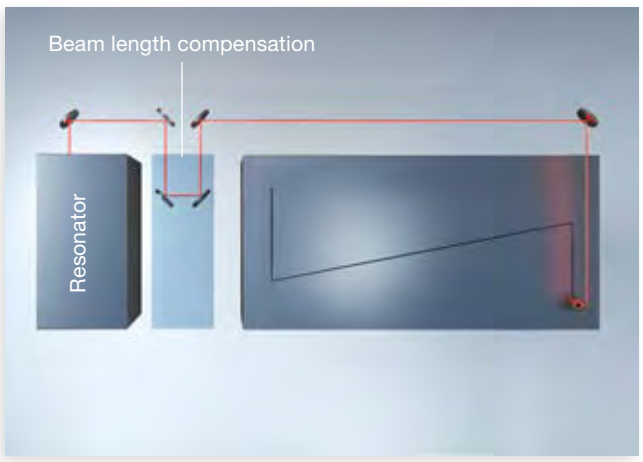
# Different beam length, different results.

Constant beam length, constant results – that‘s what you expect of Mitsubishi Electric.

**System with constant beam length**
A missing beam length compensation soon finds expression in differences in cutting performance on the table. If the results top rear and front right differ, this is not only annoying but also costly. Each Cross-Flow laser from Mitsubishi Electric comes with constant beam length – just as it has to be. Before you buy a laser cutting system, you should play safe and test the constancy of cutting quality on all four corners of the cutting table.

**High-speed power sensor**
The high-speed power sensor from Mitsubishi Electric monitors laser power in real time. It ensures that actual laser power deviates less than ±1% from the target value and thus permits the processing of strongly reflective materials such as aluminium and copper.






Of course the beam has to stay constant – but why isn't this always standard?

# How can automation boost your profits?


## Automation has to be flexible.

### Integrating different makes.

Is a laser system with a pallet changer still not enough for you? With a higher rate of automation you can boost machine capacity utilisation and produce more parts per hour. Intelligent, customised automation solutions are available so that you can achieve the state of automation that best serves your needs. The degrees of automation extend from loading and unloading systems through to the fully automatic integration of several laser cutting machines in automatic storage systems.

**Automation-ready!**
You still don't know what will await you in a few years' time and want to start on a small scale? No problem – our automation solutions can be retrofitted at any time. Your laser cutting machine can thus grow with your needs. The integration of our laser cutting machines in third-party automation systems is also possible – we would be happy to supply you with the interface information necessary for this.


Loading and unloading


Mobile material trolleys


Loading and unloading with integrated compact store


Loading and unloading with integrated tower storage system

More...


# There are plenty of software packages.

## And *you* choose the one that suits you.

Choosing the right CAD/CAM system is the key to cost-effective operation of your laser cutting system. But should it be a simple system that concentrates on the basics? Or rather the all-round program with ERP integration and integrated production planning system for programming everything from the laser cutting system to the press brake?

Whatever CAD/CAM system serves your needs best, the choice is entirely yours, as our systems are multilingual. We neither limit nor block the use of the many possibilities that programs of independent software publishers offer.

Do you already know which machines from which manufacturers you will be using in, say, ten years' time? And do you really want to have to work with several CAD/CAM systems as soon as you use machines from different manufacturers?

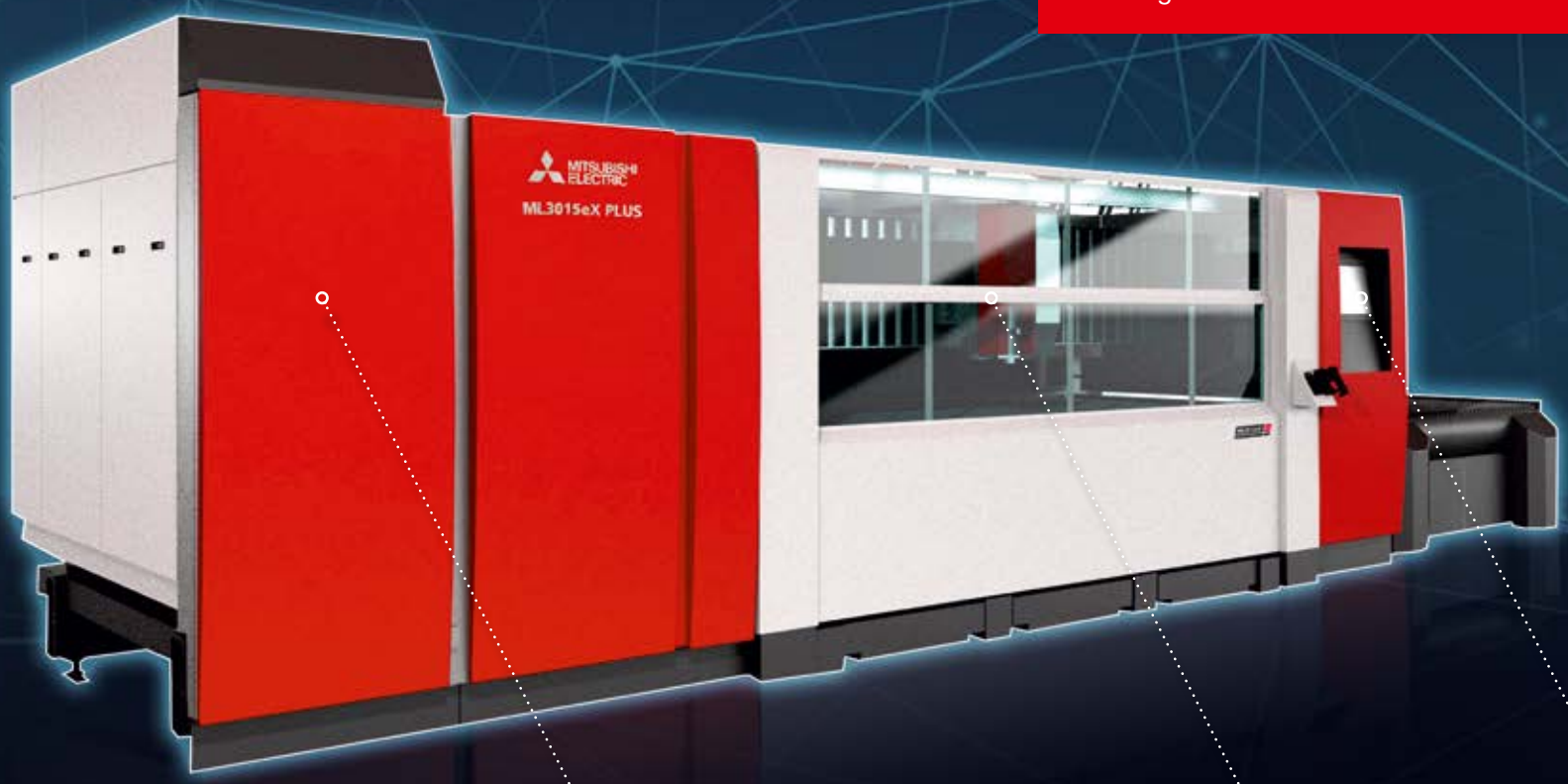
With the independent CAD/CAM systems you create programs for machines and equipment from different manufacturers. This way you purchase not just a software package but also a good deal of freedom.

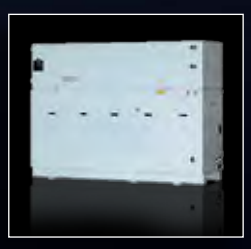
Libellula · JETCAM · lantek · WICAM NC intelligence · radan · SIGMANEST software · and many more

More…

## Key components produced by Mitsubishi Electric

Experienced and critical customers take an occasional look in the electrical cabinet to see how many names of manufacturers they can find on the installed components. Those who are careful in their choice will stay on the safe side in the long run.



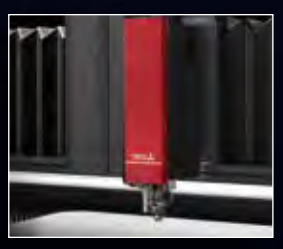


Laser sources


Frequency inverters


Servo amplifiers


Power switches


Servo motors


Laser processing heads


CNC controls

# Important: investment security!

## Why do core components produced in-house make all the difference?

**No compromises**
Only if you yourself develop and produce the key components – ranging from the CNC control, frequency inverters, servo amplifiers and servo motors to the control circuit boards and relays – can you adapt them precisely to your own needs. And only then do you have complete control over keeping quality at the very highest level. If you have to go back to third-party manufacturers for these key components, you will have to make compromises more often. These disadvantages are often not obvious at first or second glance, but reveal themselves sooner or later in the fail-safety of the overall system.

**More expertise, better results**
If you develop and produce countless components yourself, your knowledge is vastly superior. It therefore makes all the difference to know that the extra expertise built into every Mitsubishi Electric machine is on your side. If you install a lot of third-party components, you unavoidably take much greater risks, as compatibility and dependability only reveal themselves later.

**Secure supply of parts**
The biggest unsureness with a long-term investment is the reliability of the technology and a secure supply of parts. Because we do more than simply assemble our laser cutting systems, we are also independent of parts supplies from third-party sources. For you this means a parts supply and component repair well beyond the legal requirements. Because each laser cutting system consists of a number of key components. And if the parts are no longer available in just a few years' time, what will this mean for the value of your investment?

More...

# Built for decades –

## supplied within days!

Successful companies respond quickly to market requirements. To do this they need a partner that can deliver quickly when the order books for laser cutting are full. In the long term, however, rapid delivery is even more important than at the beginning. Your investment is only secure and safeguarded when all the necessary spare parts are stocked and the service required for this is locally available.

Only a company that has the necessary vertical integration (CNC controls, laser sources, laser processing heads, servo motors, servo amplifiers, frequency inverters, power switches etc.) and is thus independent of parts availability guarantees and the storage capacity of many subsuppliers can genuinely ensure long-term delivery capability and thus truly secure your investment.

From Mitsubishi Electric you can even get parts for 30-year-old CNC controls – the nerve centre of your machine – with rapid shipment or delivery by courier ex Düsseldorf warehouse if time is in short supply. On a visit to our headquarters in Ratingen, you will see that we think not in years but in generations. Anything else wouldn't be a secure investment – and secure it has to be.

MELDAS 300
On sale since 1986 – 31 years of support and still no end in sight!

More...



*If you have to wait, you lose orders.*


# Securely financed.

## An investment that pays off.

The investment in a laser cutting system is - especially for small and medium-sized companies - a significant investment that ties up liquidity and draws on credit lines. Leasing and hire-purchase are interesting alternatives!

***Leasing***

Leasing takes the strain off your liquidity and maintains your credit line. You stay flexible, as your costs are clearly defined and are financed usually from the revenue from the leased item. The leased item is not activated on your balance sheet, and, thanks to balance sheet neutrality, your equity ratio and rating are not impaired. The lease rent is treated as a tax-deductible business expense. Possible are lease terms equivalent to 40 to 90 % of depreciation due to wear and tear, which amounts to 60 months for the product category of laser cutting systems.

***Hire purchase***

Under a hire purchase agreement, BTMU Lease (Deutschland) GmbH purchases the laser cutting system that you have chosen and hires it out to you. The overall cost of the investment is spread over a contractually agreed term and covered by a monthly rent. The term and a possibly different final rental payment can be individually agreed. Unlike a lessee, the hire purchaser is the economic owner of the item. Unlike under a leasing agreement, the item automatically becomes the user's property on payment of the final rent at the end of the term.

Our leasing and financing specialist – BTMU Lease (Deutschland) GmbH – would be happy to propose a solution geared to your business needs.

**BTMU Lease (Deutschland) GmbH** is the biggest Japanese leasing partner in Germany with over 30 years' experience on the domestic market. As a subsidiary of the **Bank of Tokyo-Mitsubishi UFJ** and group company of Mitsubishi UFJ Financial Group (MUFG), BTMU Lease is a member of one of the world's biggest financial services providers. A team of leasing and financing experts manages all transactions from its base in Düsseldorf.

More…


# Service.

We’re there to help you.

**Training**
Users acquire their skills at the laser cutting system. Depending on your wishes, at Mitsubishi Electric in Krefeld or on your own site.

**Telephone and on-site-support**
Our service team consisting of our service help-desk and field service technicians ensures your long-term success. Be it support over the phone or by email, remote online support or personally on your site, you always receive reliable service from Mitsubishi Electric.

**All-round no-worry package**
You need an absolutely dependable laser cutting system and want to concentrate on your core business? With a partner noted for its decades of experience and short distances, you benefit from an all-round no-worry package that takes a weight off your shoulders.

More…



Competent support whenever I need it.


# Consumables and spare parts.

*We are there for you* – not only throughout Europe.

***Quality control***

*Consumables and accessories* for laser technology are thoroughly *inspected before release* for sale and are subject to continuous *quality control. Mitsubishi* Electric imposes exacting standards on *itself and its suppliers.*

***Availability & shipment***

*167,000 parts are stocked* for you at our warehouse in Düsseldorf. *You usually receive your* parts within a working day (shipment via *forwarding agents excluded*). Shipment by courier and collection by *the customer are also* possible.

More...

## Fiber

| | ML3015 SR-F | ML3015 eX-F Plus | ML4020 RX-F |
|---|---|---|---|



| Machine data | | | | |
|---|---|---|---|---|
| Machine design | | Flying optics | | |
| Control | | 15” Mitsubishi-Electric full-touch screen | 19” Mitsubishi-Electric full-touch screen | 15” Mitsubishi-Electric full-touch screen |
| Axis travel path | X-axis | 3,100 mm | 3,100 mm | 4,100 mm |
| | Y-axis | 1,565 mm | 1,565 mm | 2,100 mm |
| | Z-axis | 150 mm | 150 mm | 150 mm |
| Repeat accuracy | | ± 0.01 mm | | |
| Max. sheet size | | 3,050 x 1,525 mm | 3,050 x 1,525 mm | 4,050 x 2,060 mm |
| Max. weight per sheet | | 930 kg | 930 kg | 1,650 kg |

| Dimensions and weight | | | | |
|---|---|---|---|---|
| Dimensions | Laser cutting system incl. pallet changer | 10,210 x 3,130 mm | 10,210 x 3,130 mm | 13,053 x 3,450 mm |
| | Laser source | integrated | | |
| Weight | Laser cutting system incl. laser source | 8,600 kg | 9,300 kg | 11,000 kg |
| | Pallet changer | 2,100 kg | 2,100 kg | 4,000 kg |

| Laser | | | |
|---|---|---|---|
| Laser type | F20 / F40 | F40 / F60 / F80 | F40 / F60 / F80 |
| Laser power | 2 / 4 kW | 4 / 6 / 8 kW | 4 / 6 / 8 kW |
| Processing head | PH-F2 | Zoom Head | Zoom Head |

## Cross-Flow

| | ML3015 SR | ML3015 eX Plus | ML3015 RX |
|---|---|---|---|



| Machine data | | | | |
|---|---|---|---|---|
| Machine design | | Flying optics | | |
| Control | | 15” Mitsubishi-Electric full-touch screen | | |
| Axis travel path | X-axis | 3,100 mm | 3,100 mm | 4,100 mm |
| | Y-axis | 1,565 mm | 1,565 mm | 2,100 mm |
| | Z-axis | 150 mm | 150 mm | 150 mm |
| Repeat accuracy | | ± 0.01 mm | | |
| Max. sheet size | | 3,050 x 1,525 mm | 3,050 x 1,525 mm | 4,050 x 2,060 mm |
| Max. weight per sheet | | 930 kg | 930 kg | 1,650 kg |

| Dimensions and weight | | | | |
|---|---|---|---|---|
| Dimensions | Laser cutting system incl. pallet changer | 10,210 x 3,130 mm | 10,210 x 3,130 mm | 13,050 x 3,450 mm |
| | Laser source | integrated | | 2,600 x 2,150 mm |
| Weight | Laser cutting system incl. laser source | 7,500 kg | 8,500 / 8,700 kg | 12,000 / 12,200 kg |
| | Pallet changer | 2,100 kg | 2,100 kg | 4,000 kg |

| Laser | | | |
|---|---|---|---|
| Laser type | 32XP | 45CF-R / 60XF | 45CF-R / 60XF |
| Laser power | 2.7 kW | 4.5 / 6 kW | 4.5 / 6 kW |
| Pulse power | 3.2 kW | 5 / 7 kW | 5 / 7 kW |
| Processing head | PH-XS | | |

Fiber

| Material | Assist gas | F20 PH-F2 | F40 PH-F2 | F40 Zoom Head | F60 Zoom Head | F80 Zoom Head |
|---|---|---|---|---|---|---|
| Sheet material thickness in mm (nominal/maximum) | | | | | | |
| Mild steel | Oxygen | 4 / 16 | 6 / 19 | 25 / 28 | 25 / 28 | 25 / 28 |
| | Nitrogen | 4 / 5 | 5 / 6 | 6 / 9 | 6 / 9 | 8 / 12 |
| Mild steel, galvanised | Nitrogen | 2 / 3 | 3 / 4 | 3 / 4 | 3 / 5 | 3 / 5 |
| Stainless steel | Nitrogen | 5 / 12 | 8 / 20 | 20 / 22 | 25 / 28 | 25 / 28 |
| Aluminium | Nitrogen | 5 / 8 | 8 / 15 | 15 / 18 | 25 / 28 | 25 / 28 |
| Copper | Oxygen | 4 / 5 | 5 / 6 | 6 / 8 | 8 / 10 | 8 / 10 |
| Brass | Nitrogen | 4 / 5 | 8 / 12 | 12 / 15 | 15 / 18 | 15 / 18 |

Cross-Flow

| Material | Assist gas | 32XP PH-XS | 45CF-R PH-XS | 60XF PH-XS |
|---|---|---|---|---|
| Sheet material thickness in mm (nominal/maximum) | | | | |
| Mild steel | Oxygen | 19 / 22 | 25 / 28 | 25 / 28 |
| | Nitrogen | 3 / 4 | 6 / 9 | 8 / 12 |
| Mild steel, galvanised | Nitrogen | 3 / 4 | 3 / 4 | 3 / 5 |
| Stainless steel | Nitrogen | 12 / 15 | 20 / 22 | 25 / 28 |
| Aluminium | Nitrogen | 10 / 12 | 15 / 18 | 15 / 20 |
| Copper | Oxygen | 2 / 3 | 3 / 4 | 3 / 5 |
| Brass | Nitrogen | 2 / 3 | 3 / 4 | 3 / 5 |

The values quoted above are values derived from experience and assume a machine in a flawless state and normal ambient conditions.

Materials other than laser steels or special cutting contours are capable of negatively affecting the quality of cut and the maximum cuttable sheet thickness.

# Notes.

Partner

Certified



for a greener tomorrow

EN Subject to technical change and error / effective April 2018 / Art. No. 317997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Changes for the Better