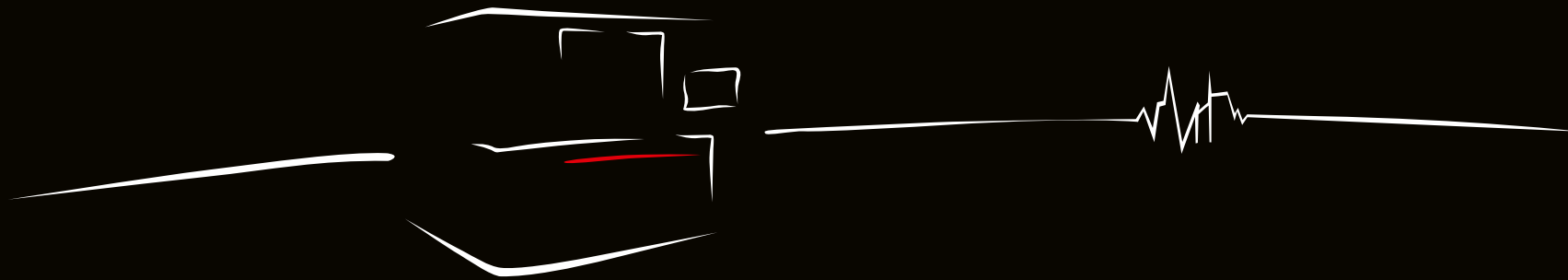


The Art of *Economy*



Wire-cut EDM

Pure Precision



MX900 SERIES

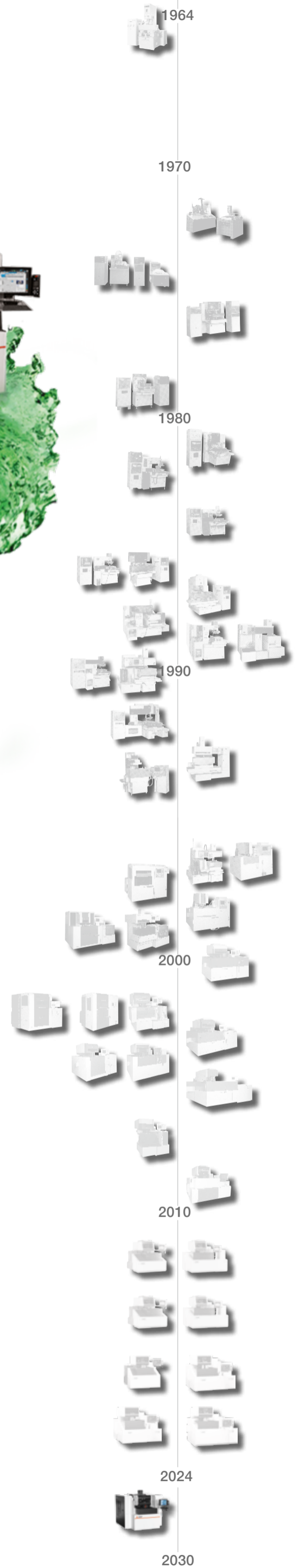


Surf the Oil Wave MX900

43 model series since 1964.

An assurance of dependability

Mitsubishi Electric	5	Highlights	7
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If you've got grand designs,
you need someone strong you can count on.



Since 1970, a growing number of European companies have therefore been turning to high-performance EDM machines from world market leader Mitsubishi Electric.

Only by producing components in-house is it possible to tailor them perfectly to the intended task. Mitsubishi Electric resorts to its own controls, semiconductors, motors and other items, which are adapted in detail to all requirements. The only thing you notice is that it works – and often for many decades after purchase.

If you want to invest soundly in a durable EDM machine, choose **Mitsubishi Electric**.



Solid machine construction – decoupled periphery

Good machining results depend on a solid machine construction – made of proven ductile iron. We’re going a step further and are decoupling the machine base from all peripheral equipment. In doing so, we’re eliminating all vibration and thermal effects on the machine – for the benefit of machining accuracy.

Continued on page 9



The speed of light ...

... for communication by fibre optics. The Tubular Shaft Drive with its highly responsive control fully exploits the benefits of high communication speed. No heat, no maintenance and no contact – just extra precision for good. At Mitsubishi Electric, this is known as “Changes for the Better”.

Continued on page 13



Extra precision and speed thanks to the generator that not only thinks, but also thinks ahead.

If you want to achieve better surface quality with fewer skim cuts, you need the right blend of mutually adapted technologies. With Precise Finish Cut, you achieve more precise results faster.

Continued on page 15



Perfection in oil
that's second to none.

The MX900 marks the dawn of a new era in precision. Developed for a combination of extreme accuracy and superlative surface quality.

Reliable threading and rethreading – even with the smallest-diameter wire

Reliable and secure threading of 0,05 mm cutting wire in a 0,20 mm start hole – success rate close to 100% and less than 10% at second attempt. See for yourself!

Continued on page 17



The finest sparks...

...are essential for superlative wire-cutting results in terms of surface quality and geometrical accuracy. The nanopulse generator is the source of these fine sparks, creating a precisely controlled, uniform spark pattern along the entire cutting path – all in the service of optimal machining in the dielectric oil.

Continued on page 23



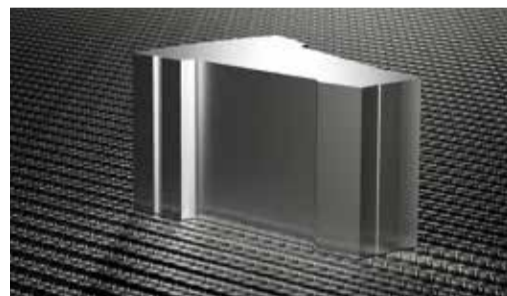
The button that programmes for you

XEDM creates the NC programme for you. Programming the machine has never been easier. The EDM-PILOT control interface is intuitive and easy to learn, ensuring simple operation and precise results. XEDM supports this and writes the NC code for you, avoiding costly errors.

Continued on page 29



Positional accuracy <math>< \pm 1 \mu\text{m}</math>



Surface roughness Ra 0.04 μm



Geometrical accuracy <math>< \pm 1 \mu\text{m}</math>



Roundness <math>< 1 \mu\text{m}</math>



Configured for precision

The MX900 has a traveling column design - proven for maximum precision with medium and heavy loads. The solid mechanical engineering as a first-class basis guarantees precision for the complete machine life.

Ductile iron.

A micrometre removed from the future.

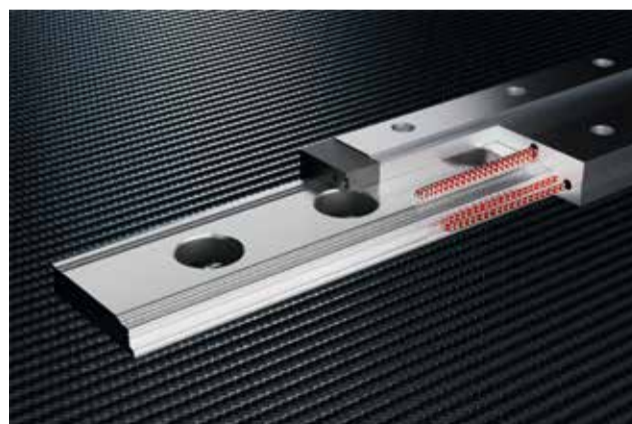


Decoupled from „vibration and heat“



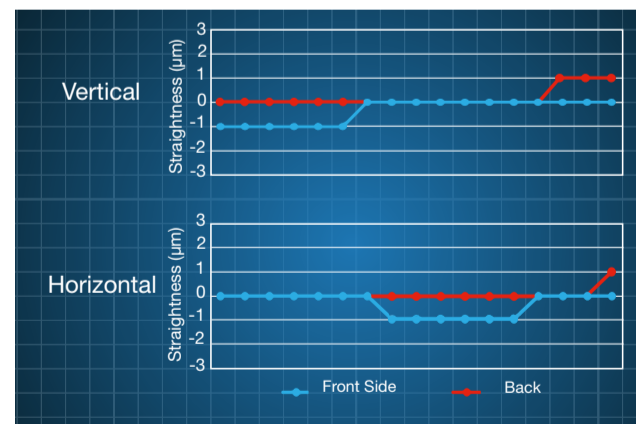
The wire-cutting machine stands within a fully enclosed housing – but on its own machine feet. All additional units are arranged on a surrounding floor slab and are fully decoupled from the machine. This eliminates disturbance caused by vibration and thermal effects on the machine.

100% more balls - more precise axis movements



The exceptionally heavy-duty machine bed, only the best, top-flight linear guides and precision assembly ensure the best wire-cutting results in the long term. The slides of the linear guides come with play-free bearings without contact between the ball bearings during movement – for maximum smoothness of motion and almost no rolling resistance.

Spheroidal graphite iron leveled by ultra-precision grinding.



A solid cast provides the best machine bed for the 8-fold supported linear guides. This ensures that your MX900 is not only ultra-precise but will remain so for a decade and beyond...

Temperature stability
Pre-calculated

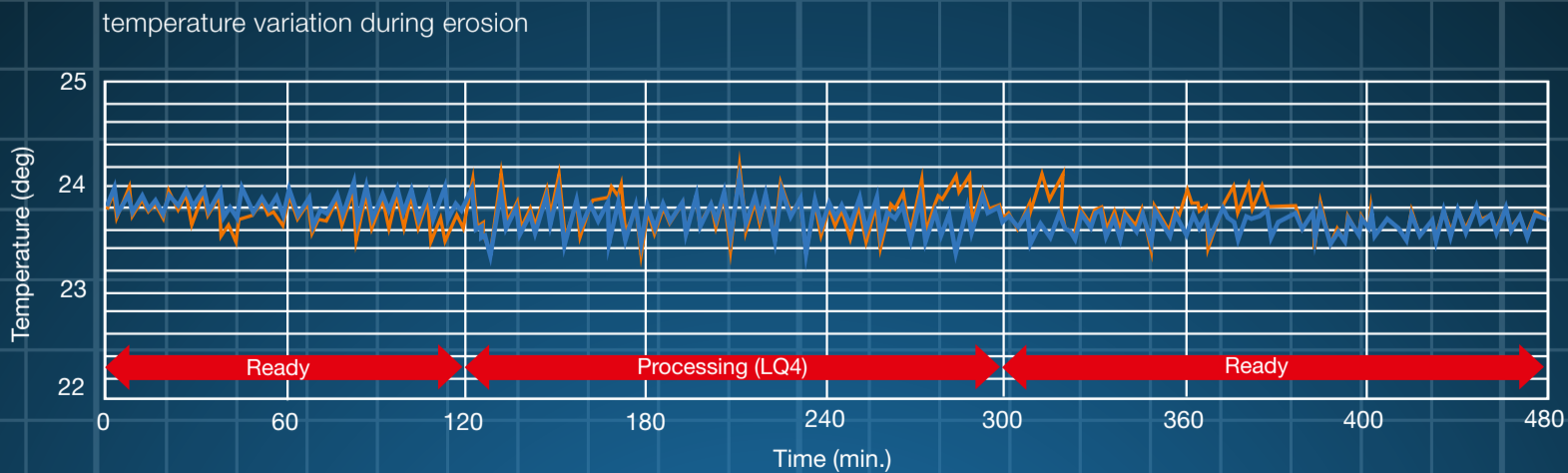
Greater accuracy with challenging workpieces through thermal decoupling and pre-control



Temperature management of the MX900

The temperature management of the MX is based on two pillars. First, external influences are minimized by decoupling the work tank and erosion area from the external environment. Second, the heat generated by pumps, other components, and the erosion process itself is pre-calculated and proactively compensated.

This is crucial because thermodynamic processes take time, and simple adjustments made later are too late for the required precision, leading to a loss of accuracy. The MX900 is simply better at anticipating these challenges.



The Tubular Shaft Motor converts energy directly into motion, without contact, without maintenance and above all without loss of precision – long-term. Combined with the 400% faster fibre-optic-based control, this superior technology can truly show what it is capable of.

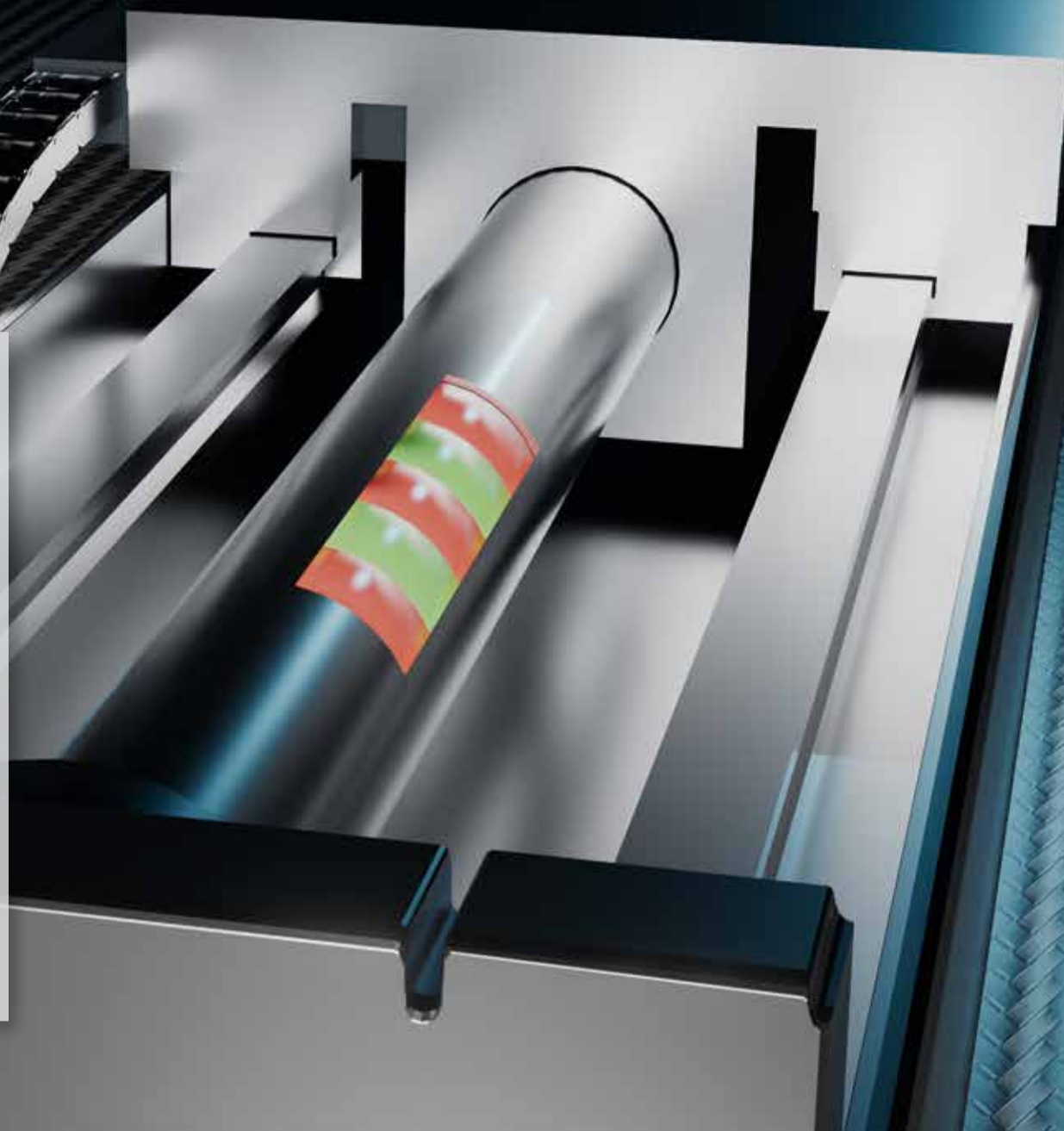
The positioning accuracy of the MX900 is $< \pm 1 \mu\text{m}$ over the entire travel path – there's a genuine 12-year manufacturer warranty for this on all Mitsubishi Electric EDM systems. An assurance of top-level durability.

Your company's technological edge has a name: Tubular Shaft Motor – from world market leader Mitsubishi Electric.



Find out more about it here:

qr.mitsubishielectric-edm.de/tubular_en



The perfect drive on positioning accuracy.



Perfect drive



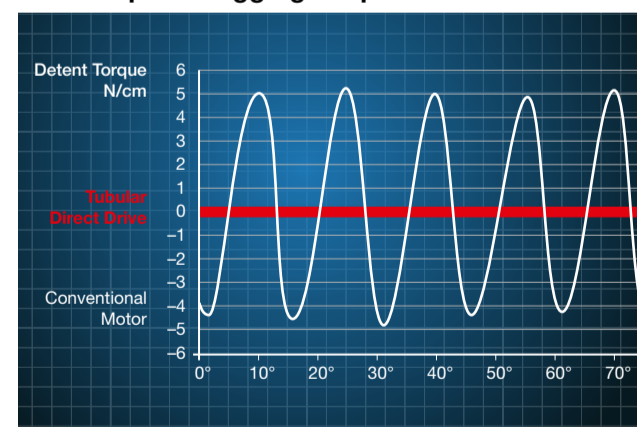
What was it about conventional drive systems that bothered developers at Mitsubishi Electric? The need for lubrication, the friction and frictional heat, power consumption, backlash, the cogging moment and above all the possible wear. Only a non-contact drive overcomes these drawbacks from the outset and is thus an assurance of better results and enhanced dependability over decades.

Speed of light



The Mitsubishi Electric polymer optical fibres have decisive advantages – not only over conventional copper cables, but also over glass fibres. Not only their total resistance to water, but also their high transmission rates combined with minimal space requirements and maximum flexibility are essential for truly progressive EDM systems. The only thing that you as a user notice is the longer service life and enhanced precision.

No disruptive cogging torque



You're surely familiar with the cogging torque manifested by a conventional electric motor. It is precisely this cogging torque that is undesirable, as are variations in torque. The tubular direct drive has neither and is therefore the optimum drive for precision applications such as spark erosion.

Brilliant Finish

- as good as Ra 0.04 μm in tungsten carbide
- in steel < Ra 0.10 μm
- even and particularly where complex geometries are concerned



Workpiece Specifications
 Material: Tungsten Carbide (KD20), 20mm
 Eroding wire: 0.20 mm brass
 Surface roughness: 0.04 μm Ra

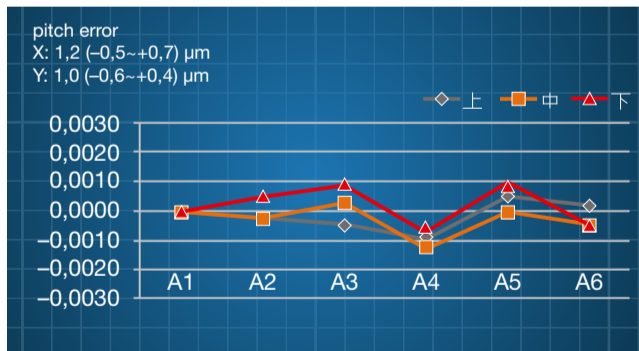


It's the result that counts.

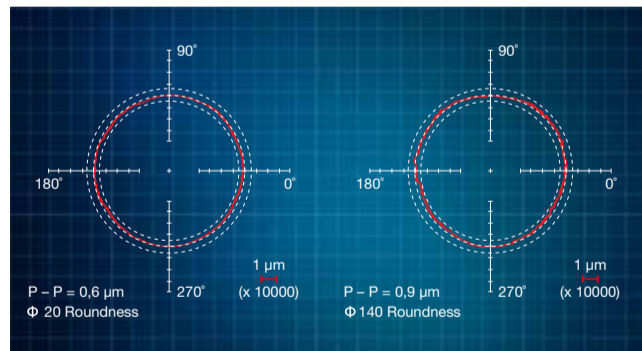
How to achieve it with μm precision.



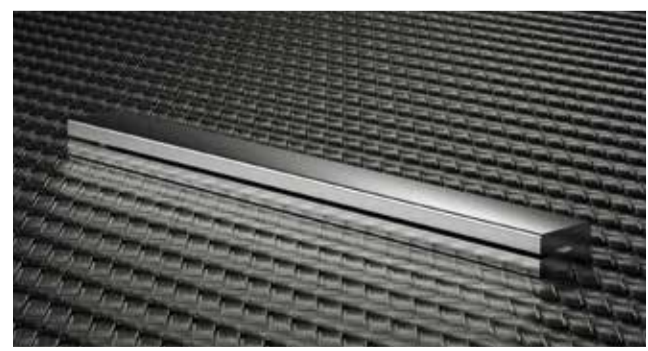
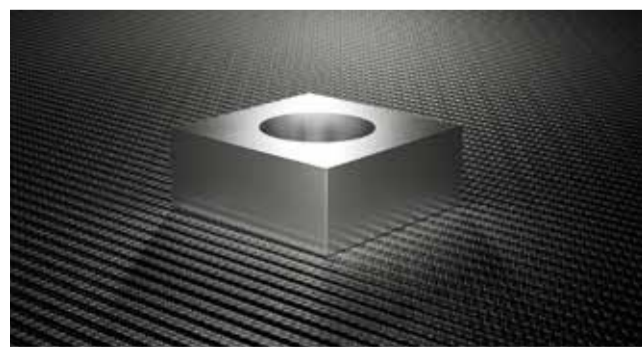
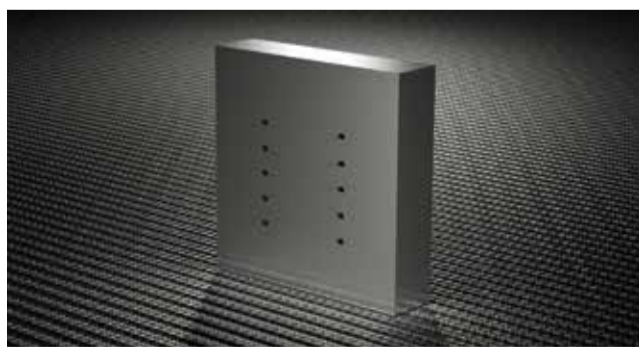
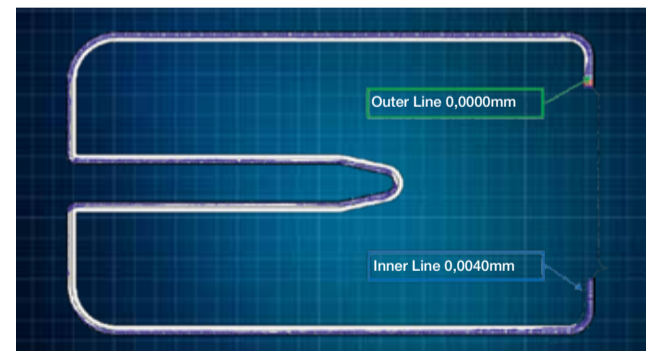
Positioning accuracy all the way
 Positional variation less than 1 μm over the entire 300mm travel path.

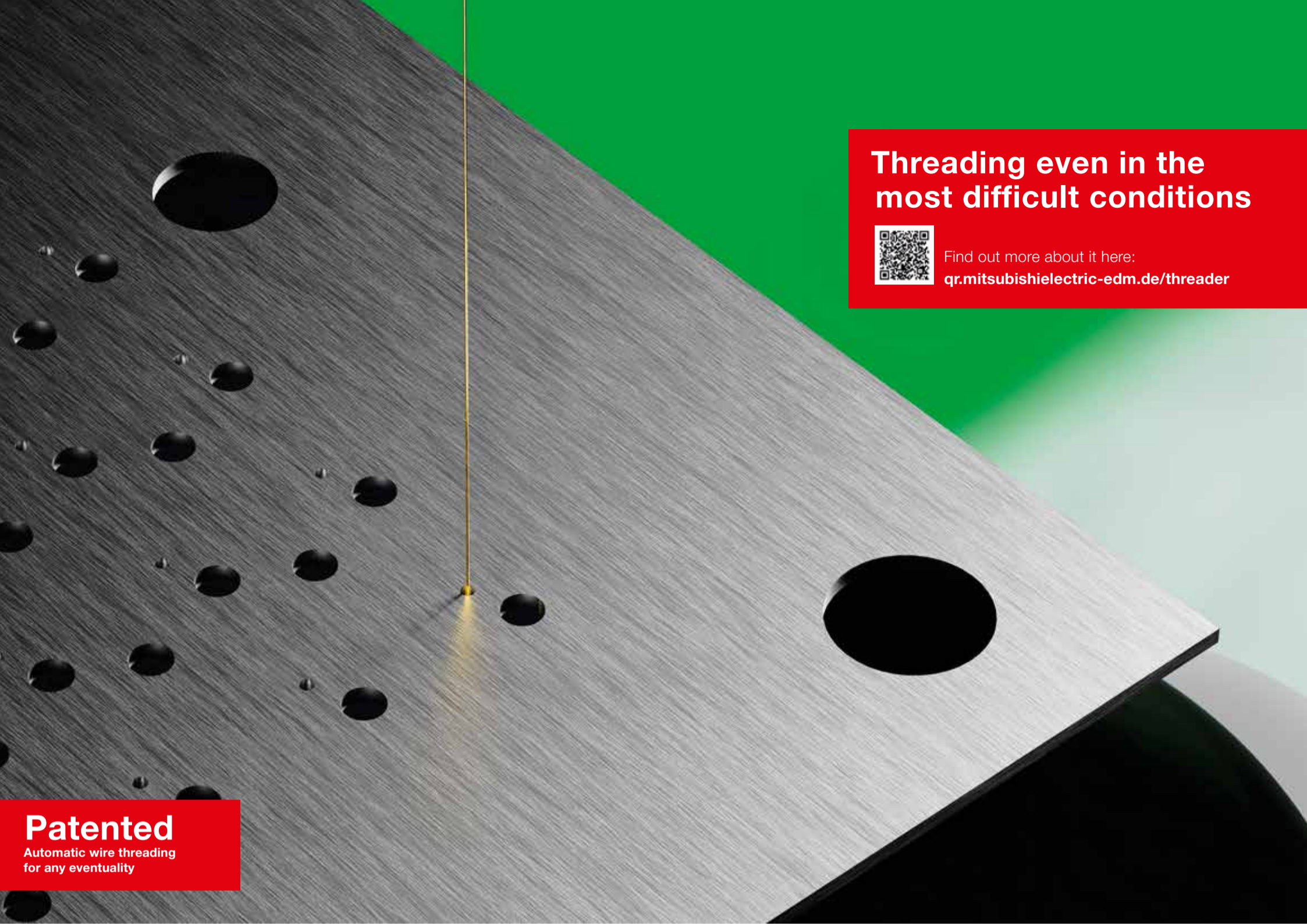


Full circle
 30mm circle and 20mm cutting height with precision of 0.73 μm in circularity.



It's the contour that counts
 $\pm 1 \mu\text{m}$ – maximum dimensional accuracy here taking the example of a 40mm tall component.





Threading even in the most difficult conditions



Find out more about it here:
qr.mitsubishielectric-edm.de/threader

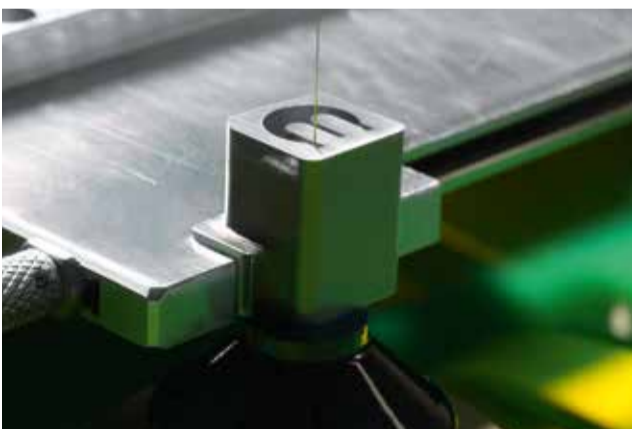
Patented
 Automatic wire threading
 for any eventuality

Vastly superior.

The wire threader for maximum dependability.



Wire break point insertion



Whether smallest start holes, difficult conditions, or re-threading - the Intelligent AT of the MX900 is equipped for it. Even in the field of micro and precision machining, a high degree of autonomy is essential. The MX900 gives you that, guaranteed!

Round diamond guide



Maximum precision and durability ensure the best results in the long run - inclusive of maintenance-friendliness due to a small number of parts and simple design.

Flexibility - when it comes to wire diameter



The Intelligent AT in the MX900 is designed as standard for wire thicknesses of 0.05-0.20 mm (0.03 mm available as option). The right range for all applications.



Learn more...
qr.mitsubishi-edm.de/threader_mx



MAISART
Mitsubishi Electric's
own strategy for AI

Precision in every detail

Whether difficult conditions or finest geometric details - mastered with AI.



Thin wire – for that extra edge in results



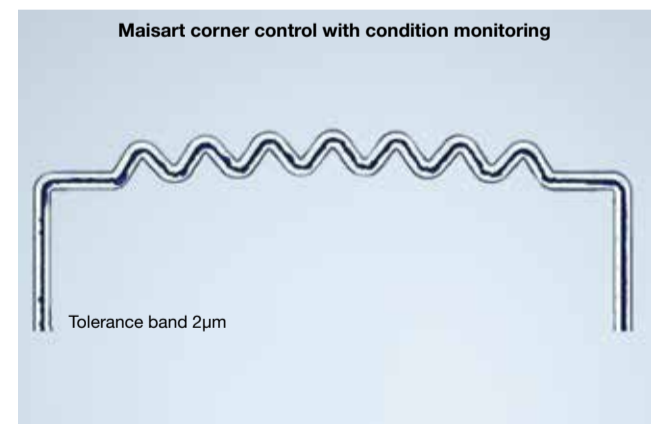
It's all about accuracy, surface quality and precise component geometry. With 0.05 mm and 0.07 mm thin wire, you get the very best out of your workpiece. Brilliant surface quality even with delicate components featuring micro-webs, fins and inserts. Reliable process performance – no other machine represents this better than the MX900.

Top results under difficult conditions



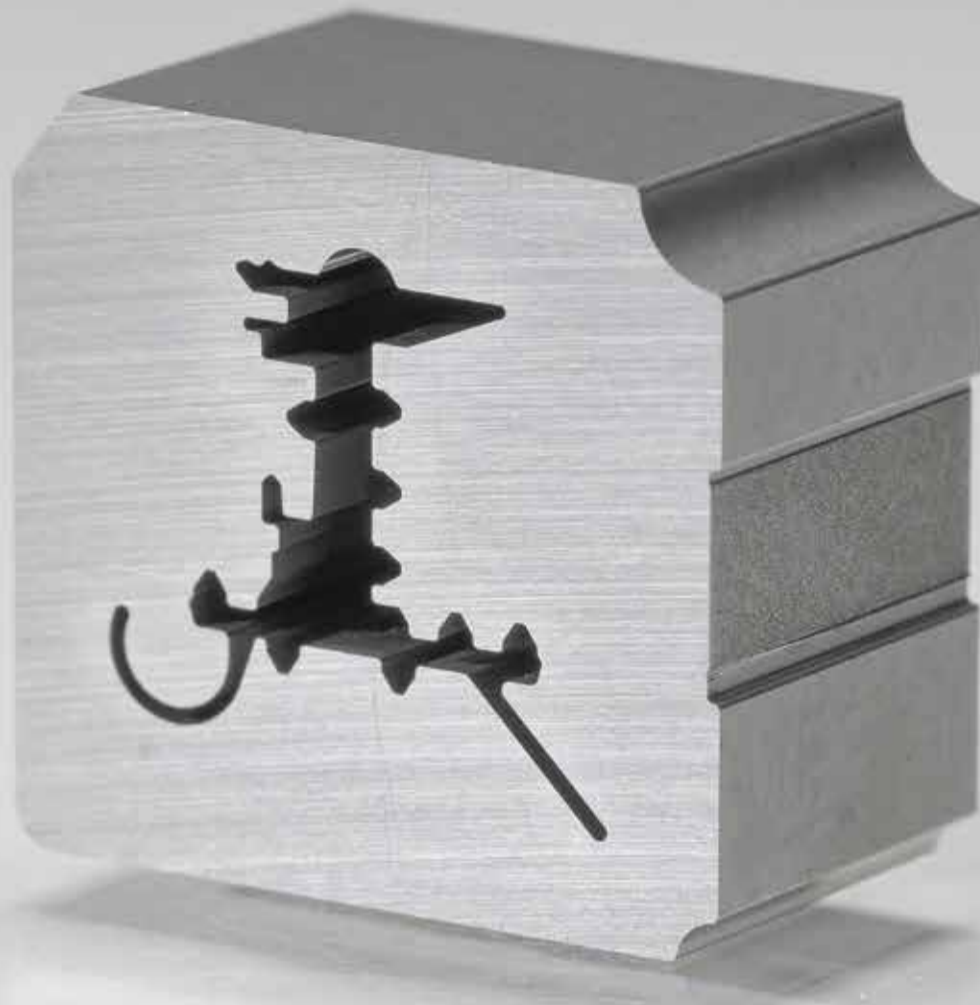
AI-based technologies specifically learned for the difficult situations of wire EDM. MAISART guarantees the best and repeatable results in terms of geometric and dimensional accuracy even under varying conditions.

Most precisely - even in delicate details



MAISART - the solution for small internal and external radii as well as complex geometries. AI ensures the predictive use of optimal parameters depending on the current workpiece geometry - in real time.

Unleash the Genius
in Your MX900

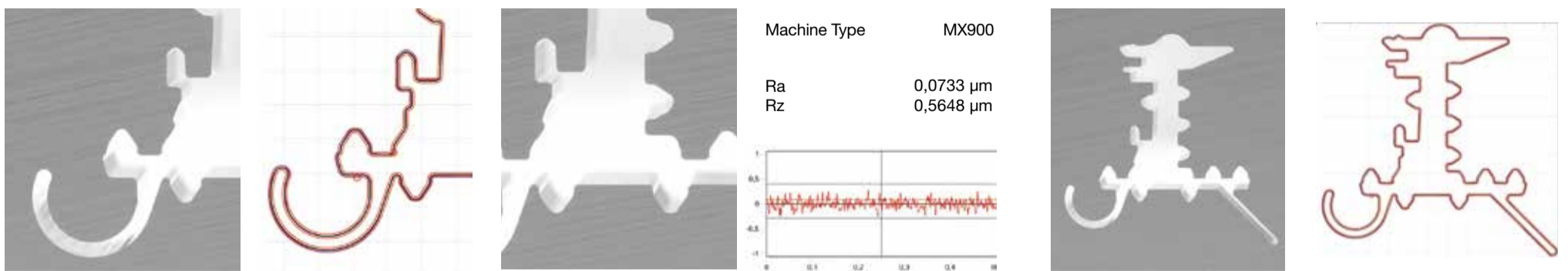


Mastering Intricate Geometries Perfectly with MAISART® demonstrated through an exemplary example



Admittedly: It's a fantasy component. But one that illustrates many facets of demanding tool components. This example demonstrates some of the results of developments in the field of Artificial Intelligence at Mitsubishi Electric. See for yourself and look forward to ultra-precision.

With MAISART and the necessary framework conditions, tolerances in the μ range become achievable. The most intricate structures become accurately reproducible. And surface qualities in the sub- μ range are generated homogeneously and repeatably. These data speak for themselves:





Twice-as-fast spark detection

The high-speed digital control works up to twice as fast as traditional machines. A great basis for immaculate component results – in terms of geometrical trueness and surface roughness.



Pulse duration: 1 billionth of a second.

The royal road to nanoprecision.



Response time is decisive

The lower the energy input, the better and more stable the cut edges. A larger number of shorter pulses achieve the highest precision ever coupled with good cutting speed – minimising microcracking in the material as a side-effect. The reduced damage in the edge zones and better structural integrity yield much extended service life, and not only that of stamping tools.

Extremely low risk of microcracking

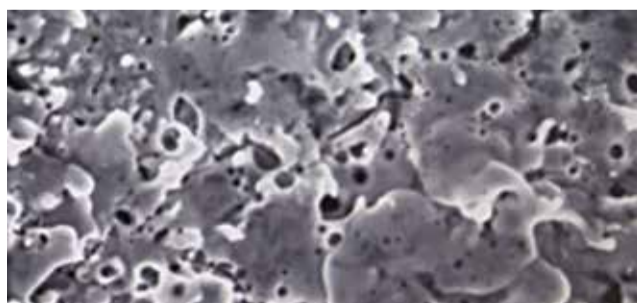
The special feature of the MX900's nPV Generator designed for dielectric oil is its gentle application of energy to the workpiece. Extended tool life for cutting punches and other similarly stressed components is an inevitable consequence.

Good removal rate and superlative surface quality

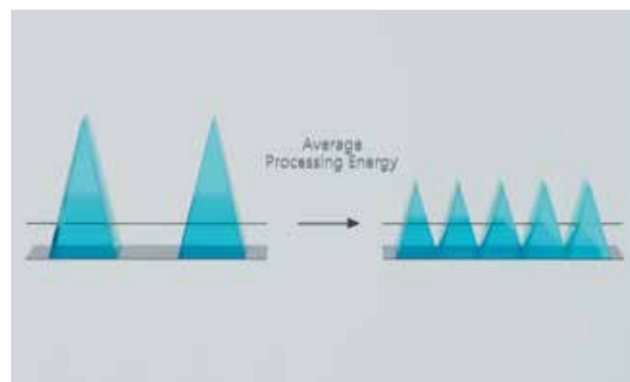
The new nPV Generator succeeds in using the same quantity of energy to machine the material while significantly reducing the energy peaks on the workpiece. This is achieved by applying lower energy to the workpiece at higher frequency.

The nPV Generator

The various units of the generator have been perfectly matched, making it possible to achieve a good removal rate combined with a superlative surface finish.



nPV - Hardly any micro-cracks present



Surface quality Ra 0.08 µm



Lasting precision and extra maintenance-friendliness.



Cutting wire replacement



Simply replace the spool and feed the cutting wire over the feed rollers. Everything ready for work again in 92 seconds.



Now watch:
qr.mitsubishi-edm.de/spool_mx

Automatic central lubrication

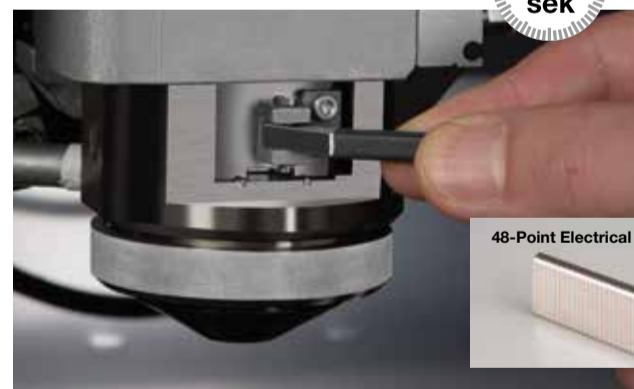


Makes for smooth running long-term – entirely without stoppages, lubrication nipples or cumbersome grease guns. You can now make more productive use of this time.



Now watch:
qr.mitsubishi-edm.de/oil

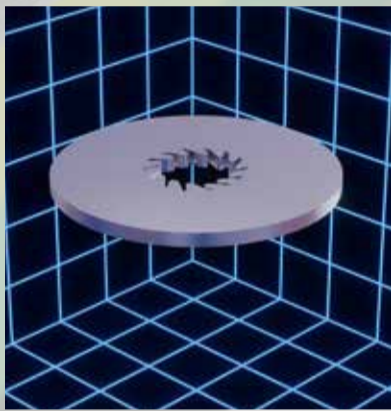
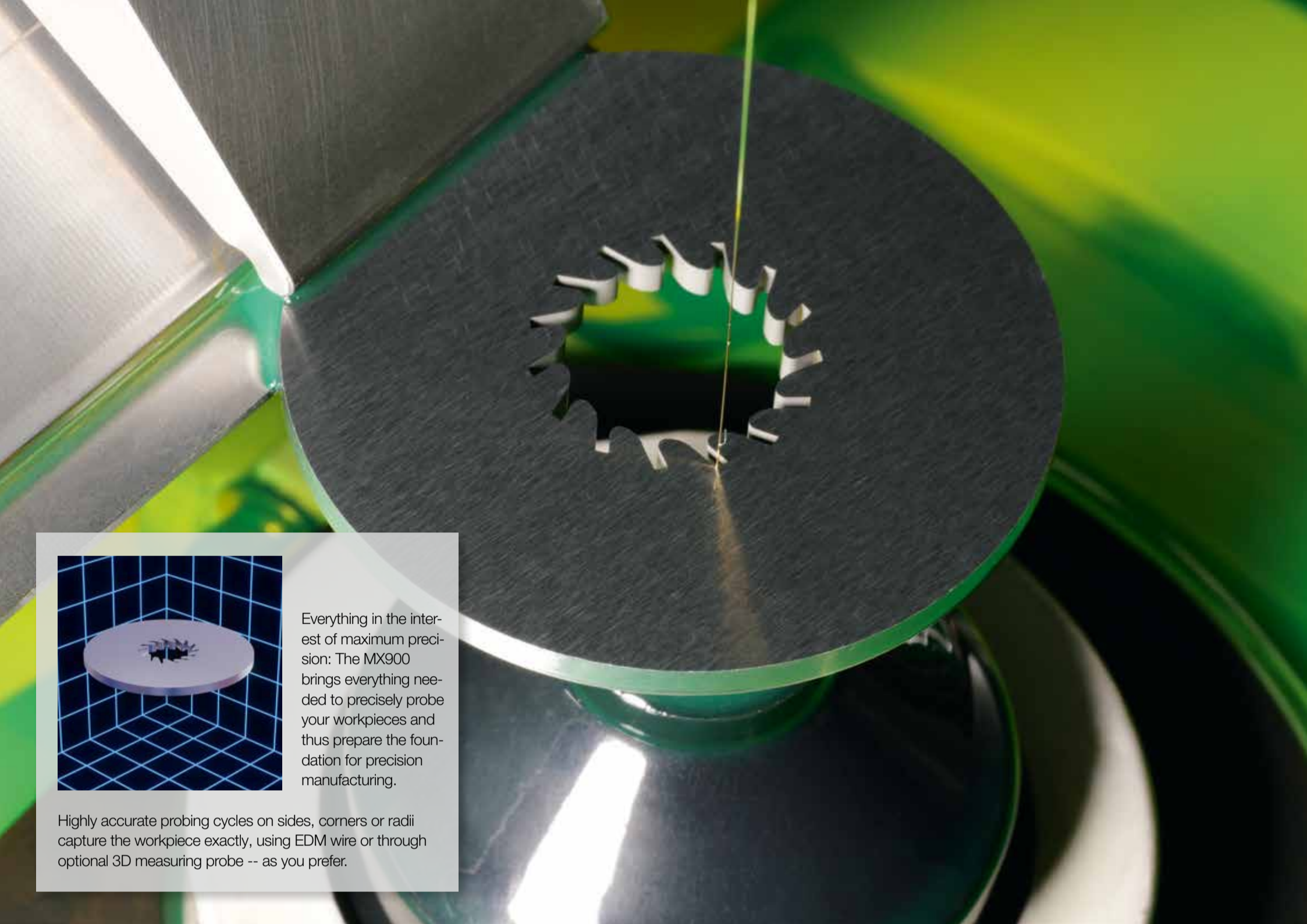
Changing the power feed contact



Replace the power feed contact with just one hand and a small gauge – at speeds like in Formula 1®.



Now watch:
qr.mitsubishi-edm.de/power_mx



Everything in the interest of maximum precision: The MX900 brings everything needed to precisely probe your workpieces and thus prepare the foundation for precision manufacturing.

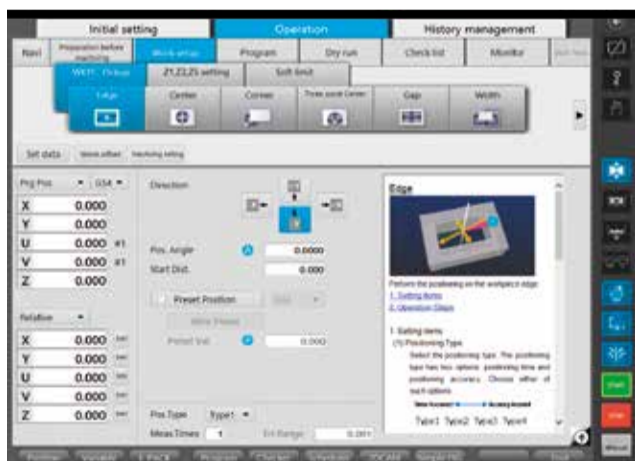
Highly accurate probing cycles on sides, corners or radii capture the workpiece exactly, using EDM wire or through optional 3D measuring probe -- as you prefer.

Clamp it and press *Start!*

Smart user guidance, easy work set-up.



Fully automatic alignment cycles



Intelligent user guidance takes you to the finish. The electrical discharge machine takes you quickly to your goal.

Manual control



Comfortable set-up with the manual control box: standard equipment with Mitsubishi Electric. All essential control functions at hand – wherever you need them.

3D position measuring – manual or automatic



Both are possible. As a user, you decide whether you do set-up classically by hand or the machine automatically defines the position of your workpiece. Using the cutting wire or pick-up coil – the machine takes care of it for you. It only takes the press of a button.

**EDM-PiLOT, the button that can program ...
program really well...**



Even I, as a sales manager, can suddenly program ...

Hans-Jürgen Pelzers
Sales Manager at
Mitsubishi Electric EDM



To the video!
www.mitsubishielectric-edm.eu/xedm

EDM-PiLOT

Automatic programming from 3D data included



Programming without training



XEDM on the machine control or XpressCAM on the PC - both allow intuitive programming based on 3D data. Lengthy training is eliminated thanks to the revolutionarily simple operating concept - up to fully automatic NC programming based on clean design data.



Read more...
qr.mitsubishielectric-edm.de/me_xedm_en

XEDM on the machine control - Standard scope of delivery



3D programming at the machine? Why not - when you need flexibility and speed. Of course it works! I can simply define the cutting sequence myself, influence the separation of scrap parts, change other parameters. I can do it, but I don't have to! Because XEDM is intelligent and automatically suggests the optimal strategies and settings.

XEDM and EXPRESSCAM - the strong team



XpressCAM - the extended version of XEDM for PC shares the same base data with XEDM, and can additionally process 2D data in DXF format. On the machine, any program can be modified using XEDM. This also makes machine changeover simple. One click is enough and it runs, as the machine recognizes itself that the program is not intended for it. That's intelligent!

A toolmaker increased his effectiveness by 387 %.
Find out how here ...



Your Digital Shopfloor for Your Machines from the WBA

Toolmaker Klaus Baier increased his productivity by 387%.

You too can boost your productivity with the WBA ...



Learn more ...
qr.mitsubishielectric-edm.de/wba_en



Your MX900

Always ready at hand

 Option

 **NUI**
NATURAL
USER
INTERFACE

You can control the machine and keep an eye on processes, wherever you are. Intelligent communication takes the pressure out of work. Ideal combined with automation solutions and high process autonomy with the intelligent AT wire threader.

mcAnywhere Service

Rapid help from Mitsubishi Electric experts, thanks to remote access to the machine control.

mcAnywhere Live Service

Machine running, thanks to Live Service without travel time. A Mitsubishi Electric technician looks at your machine and solves your problem. No solution, no costs—this is how results are achieved.

mcAnywhere Control

Comfortable and reliable remote control for your EDM system – powered by TeamViewer.

mcAnywhere Contact+

Any time, any place ... you're always up to date with direct status reports by email.



Motorsports is precision -
the MX900 celebrates the μm

Racing car
KICK Sauber C45

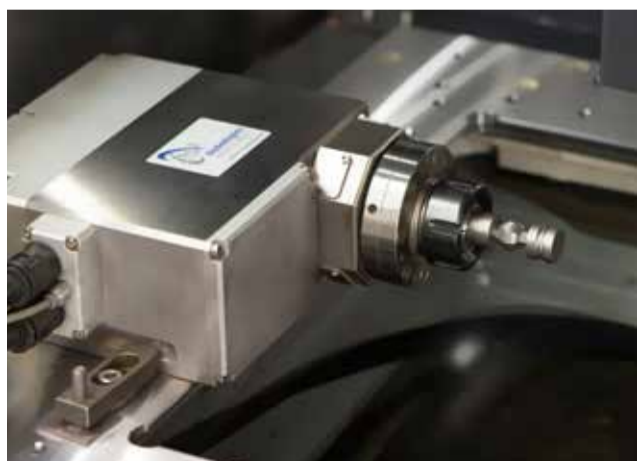


More axes.

A chance to extend your options.

 Option

B-axis



A servo-controlled B-axis fully integrated in the machine controls permits wire cutting on a rotating carried workpiece. Separation and multi-sided machining can be performed in a single clamping as well as simultaneously.

Mini-rotational axis



Rotating spindle also fully integrated in the machine control with positioning for the most minute high-precision components, e.g. the manufacture of ejector pins with a diameter of $\geq 0.05\text{mm}$, the realisation of conical threads in medical technology, erosive grinding, turning and simultaneous machining.

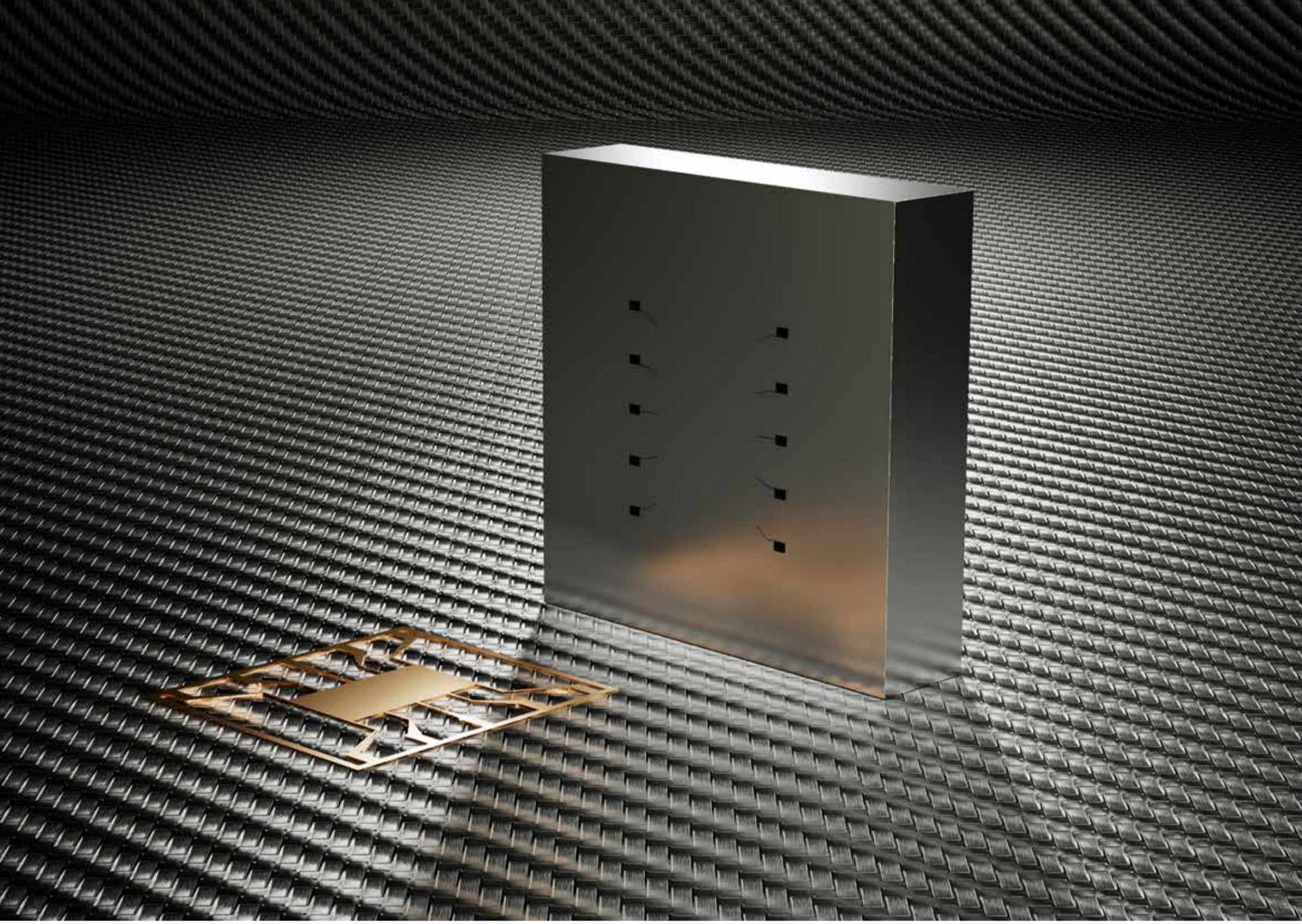
Rotary/tilting axis



Innovative applications, such as the production of carbide micro tools on a rotary/tilting axis, are made possible in an oil bath with the highest precision. Other components? No problem – the degrees of freedom are virtually endless.



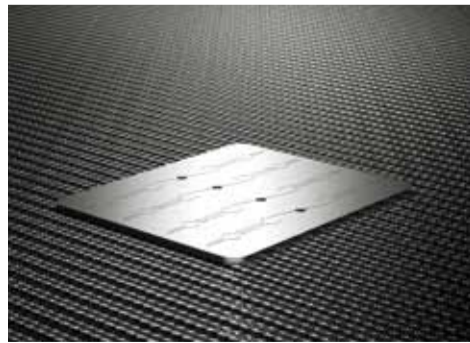
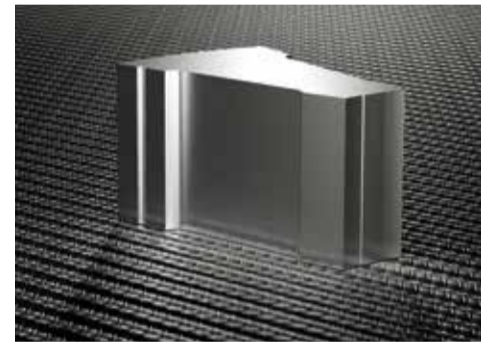
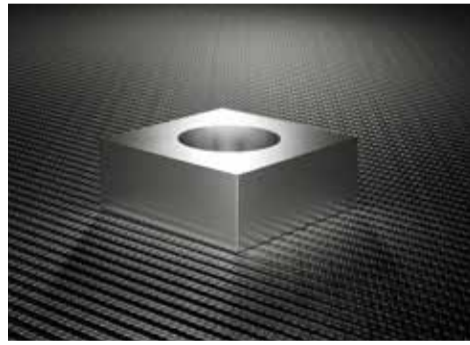
Now watch:
qr.mitsubishi-edm.de/mikrowerkzeuge



Successfully mastered!

The success factor in a wide range of fields.

Medicine · Vehicle industry · Communications / Electrics · Aerospace · Watch industry





Service hotline: +49 (0) 2102 486 7600
Application support: +49 (0) 2102 486 7700
 Monday to Friday: 7.30am to 8pm / Saturday: 9am to 4pm (CET)

Service.

We're there to help you.

You don't like call centres and queuing systems? We don't either. With every Mitsubishi Electric EDM system you buy excellent service as part of the package. Service is performed by our own highly skilled service technicians so that production is kept dependably up and running. Users are assisted over the phone and benefit from the expertise and wealth of experience of Mitsubishi Electric specialists.

Warehousing and logistics



We supply all in-stock products (wear and spare parts) even outside normal business hours, e.g. by courier or collection. Our proximity to Düsseldorf Airport and motorway links enables us to ship parts at high speed.

Original Mitsubishi Electric parts



All standard spare parts of the Mitsubishi Electric consumables line are original imports or fabricated in Germany in accordance with the development and design specification. You receive original parts of immaculate quality at attractive prices.

Support when you need it



With strong support from Mitsubishi Electric across all channels:

- Phone
- On-site service
- Online service via McAnywhere Live

Your machine runs exactly as you need it, precisely according to plan.



Now order parts at...
www.edmshop.de or edm.parts@meg.mee.com



Expert support via smartphone

mcAnywhere Live

Seen, understood, resolved...

Machines need to run...



Solve machine problems faster than ever before with real-time remote diagnostics and without travel delays. A Mitsubishi Electric technician takes a real-time remote look at your machine and resolves your problem.



Find out more now...

qr.mitsubishielectric-edm.de/mcanywhere_live_en

The expert sees it, the expert solves it



Thanks to cutting-edge remote technology, mcAnywhere Live enables Mitsubishi Electric technicians to digitally connect to your machines, diagnose problems, and often resolve them in real time. This means faster service, lower costs, and immediate production uptime for your company.

No success via remote support – no costs!



If the problem can't be resolved online, there's no charge. During the warranty period, mcAnywhere Live is completely free of charge. You save on travel costs, reduce downtime, and protect the environment - because there's no need for on-site visits.



Watch the video now:

qr.mitsubishielectric-edm.de/mcanywhere_live_video



Training.

Helping you to stay up to date.

Learn on site – your EDM training takes place at our own Technology and Training Centre in Ratingen.

Programming without prior training



Users learn how to operate the machines directly – hands-on at the machine itself and at specially equipped CNC workstations. This ensures maximum benefit from direct knowledge transfer.

All training takes place at Mitsubishi Electric in Ratingen. Additional courses are also offered by our international partners.

Courses, seminars and user workshops



Our wide range of training programs covers everything from basic knowledge to customised courses tailored precisely to the training needs of your employees. In addition, we regularly offer free application workshops for our customers, covering current topics in both theory and practice.

Skilled Worker Express



In a compact, four-week intensive course, participants acquire hands-on know-how directly on state-of-the-art Mitsubishi Electric machines. This enables you to quickly qualify skilled personnel with immediate added value for your production – without lengthy recruitment processes.



Hard Facts, Measurable Productivity Gains through Digitalization

Tool manufacturer increased its effectiveness by 387%

Find out how....

Optimization explained simply



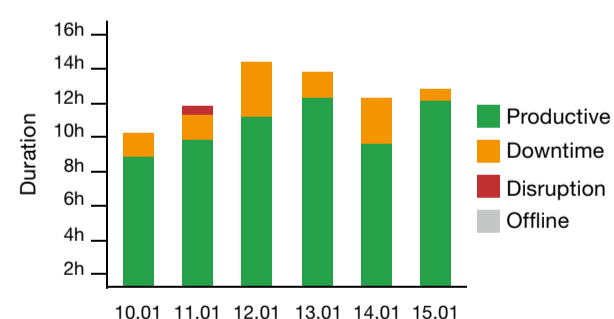
Mitsubishi provides machine data that WBA uses to improve production processes. This enables highly precise data analyses to be performed in real time. You benefit from optimized production, reduced downtime, and better products, as continuous data analysis enables finer control and adjustment of machine processes.

Seamless integration of machines



Thanks to the WBA IIoT platform, seamless integration of machines and equipment is effortlessly possible. Regardless of which devices you use, the platform ensures flexible adaptation to your production requirements and offers scalability so that your system can grow with your company.

All data at a glance



With the "At a Glance" solution, you always have a complete overview of your production processes. Real-time data gives you immediate insight into machine status and production progress.



Learn more now...

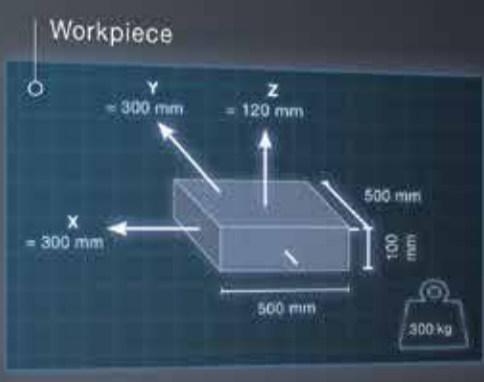
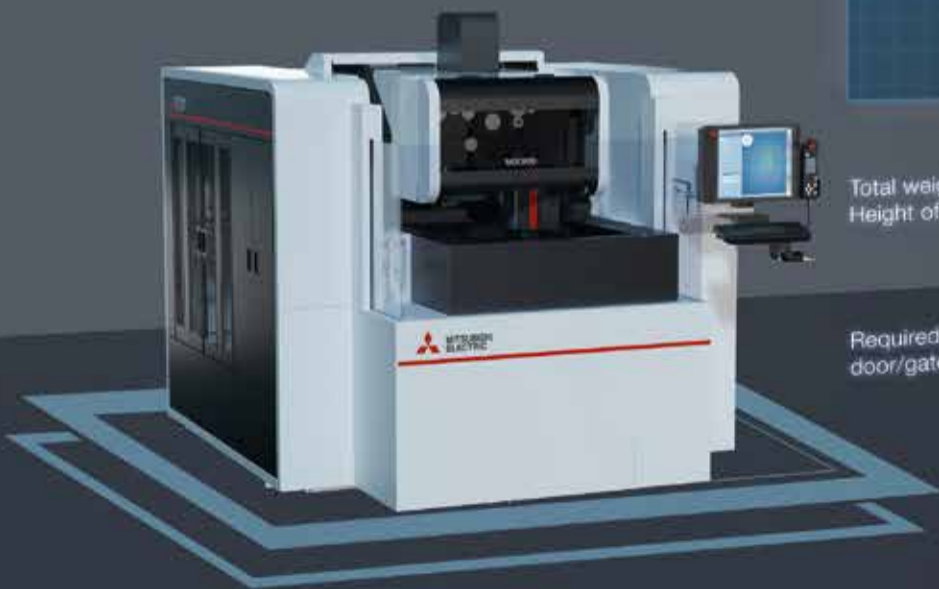
qr.mitsubishielectric-edm.de/wba_en



Technology and soul
signed in stainless steel ...

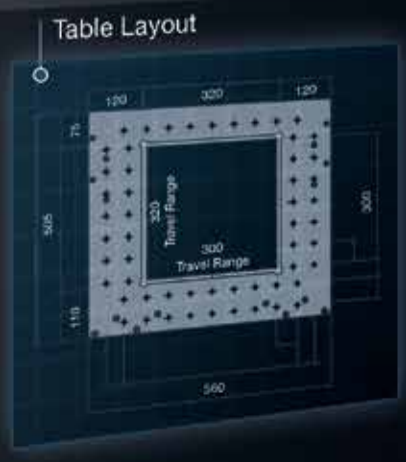


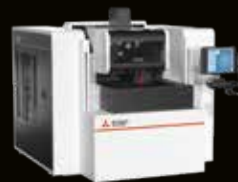
MX900



Total weight.....4000 kg
Height of the machine.....2174 mm

Required minimum dimensions for door/gate openings (W x H) in mm..... 1500 x 2200





Machine	MX900
Travel (X/Y/Z) in mm	300/300/120
Travel (U/V) in mm	(+/- 35)
Taper angle (workpiece height) in °/mm	Max. 15°
Max. workpiece dimensions (WxDxH) in mm	500x500x100
Max. workpiece weight in kg	300
Table dimensions (WxD) in mm	560x505
Table layout	Hardened 4-side table
Possible wire diameters in mm	0,05–0,2
Wire spool capacity in kg	10
Automatic wire threader / wire chopper	Yes
Overall dimensions (WxDxH) in mm	2335 x 2575 x 2174
Machine weight in kg	4000
Mains voltage	3-phase 400V/AC ± 10%, 50/60Hz, 13 kVA
Filter System	
Tank capacity in l	325 (Initial filling 350 l)
Filter particle size in µm / filter elements	3/2
Temperature control	Dielectric cooling unit
Generator	
Power supply unit	regenerative transistor pulse type
Cooling method	fully sealed / indirect air cooling
Max. output current in A	50
Control Unit	
Input method	Keyboard, USB flash drive, Ethernet, 19" touchscreen
Control system	19" touchscreen / CNC, closed circuit
Min. command step (X/Y/Z/U/V) in µm	0,1
Min. axis resolution in µm	0,05

Equipment	MX900
Tubular Shaft Drives with linear scales (X/Y/U/V)	Yes
Control M800 with 19" full-touch monitor	Yes
Hand pilot with configurable LCD monitor	Yes
Automatic vertical front door	Yes
Digital AE II generator	Yes
Hardened 4-side frame table	Yes
Ethernet/DNC/FTP	Yes
McAfee AntiVirus embedded	Yes
Sleep mode	Yes

Optional Tools	
mcAnywhere Service / Live Service	Yes

Optional Hardware	MX900
Thin wire specification 0.03 mm	Optional
Angle Master Advance II – basic kit incl. aligning device	Optional
Angle Master Advance II – Wire guide kit	Optional
External signal output with relay board	Optional
Tricolour status lamp	Optional
Automatic Renishaw probe	Optional
ERGO-LUX LED floodlight	Optional
Additional axes / rotational axis	Optional

Power connection: 3-phase 400V/AC, PE, ± 10%, 50/60Hz, fuse protection min. 32A slow-blow
Pneumatic connection: 5–7 kgf/cm², 500–700 kPa, air flow rate min. 75 l/min, 3/8" hose connection

The EDM system should be installed on a suitable hard industrial floor, preferably a compacted concrete floor. Shielding measures that may be required according to the EMC Directive are not included in the scope of supply from Mitsubishi Electric.

The cooling unit contains the fluorinated greenhouse gas R410A. Further information can be found in the corresponding operating manual.



Details can be found in the machine installation plan:
qr.mitsubishielectric-edm.eu/downloads_en

Partner



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