MITSUBISHI ELECTRIC

MITSUBISHI ELECTRIC

100 YEARS OF INNOVATION

Anniversary

The Art of Economy

Issue 01/21

100 YEARS MITSUBISHI ELECTRIC

From fan manufacturer to the world's second most innovative company.

Read the story – p. 60

Cutting UNESCO World Heritage with EDM.

Ludwig Borovnik

p. 42

For 100,000 eyes. Micro-precision in series.

Jansen Precisie Techniek

p. 22

The smart magazine for users.

Profile

Contents

6

3000 mm progressive die production.
Werkzeugbau Kleiner makes it big …
Kleiner GmbH

EDM for UNESCO World Cultural Heritage.
What Ludwig IV and V get out of their eroding machine.
Ludwig Borovnik KG
Guns & Rifles

42

100 YEARS MITSUBISHI ELECTRIC

60 100 years of company history

66 Mitsubishi Electric's plan for the future

76 30 years at Mitsubishi Electric – the interview

Exciting reports from the world of EDM – and Mitsubishi Electric.

User reports

14 Toolmaking overview.
Which solutions are proven in the field?
Mitsubishi Electric

22 For 100,000 eyes.
Micro-precision in series.
Jansen Precisie Techniek

30 Grinding and honing are so 2017.
All in one go with the MP1200 Connect.
Winkler Präzisionswerkzeuge GmbH

36 Specialist for almost 50 years
in finished parts that require no reworking.
Winfried Keine Metallverarbeitung

54 When every micrometre counts.
Tool steel, carbide, ceramics, polycrystalline diamond…
Hemmann Schleiftechnik GmbH

16

Keeping intruders at bay.
The Swiss love precision when it comes to lock cylinders as well.
Halter AG Frutigen

Regular items

4 Editorial

5 News

13 Back issues/change of address

50 Tea is a work of art
that needs the hands of a master.
Japan Special

78 Horoscope for hard-wired EDM experts

Legal notice

Published by
Mitsubishi Electric Europe B.V.
Niederlassung Deutschland
Mechatronics Machinery
Mitsubishi-Electric-Platz 1
40882 Ratingen · Germany

Tel +49 (0)2102 486-6120
Fax +49 (0)2102 486-7090
edm.sales@meg.mee.com
www.mitsubishi-edm.de

Copyright
Mitsubishi Electric Europe B.V.

Editorial board
Hans-Jürgen Pelzers,
Stephan Barg,
alphadialog public relations

Design and layout
City Update GmbH · Germany

Editorial – 100 Years of Mitsubishi Electric

> The older you get, the more your birthday cake looks like a torchlight procession.
>
> *Katharine Hepburn*

Mitsubishi Electric's torchlight procession is just getting started.

Despite the high level of innovation that has made Mitsubishi Electric the world's second most innovative company, it is also aware of the challenges that innovation brings: the perfect coordination of new functions for different fields of application. After 57 years of development work on EDM machines, it would be nice if many things could be done even faster. But some things simply take time. A long history provides assurance – but it gets really exciting when it comes to new ideas. You can find them on page 60.

With 50 years of experience in the production of finished stamped and bent parts without any need for reworking, there is quality every tenth of a second at Keine Metallverarbeitung (page 36). For those who appreciate things a little slower and more stylish, I recommend finding out how to create UNESCO World Heritage with an EDM system, as achieved by Ludwig Borovnik KG on page 42.

But now it's time to celebrate the first 100 years of Mitsubishi Electric – and together with, among others, Thomas Schreiber, who, just like myself and a few other colleagues, has been with Mitsubishi Electric for exactly 30 years (page 76).

With such a loyal team and such ground-breaking innovations, the next 100 years can happily come ...

Hans-Jürgen Pelzers
from the Technology Centre in Ratingen

Hans-Jürgen Pelzers
Sales Department Manager

Enjoy your read of this issue!

News

Mitsubishi Electric to supply lifts and escalators to One Bangkok global landmark

Mitsubishi Electric's subsidiary Mitsubishi Elevator is supplying 278 lifts to Thailand, including the country's first dual-cab lifts, following a major order from One Bangkok. One Bangkok is the largest private-sector property development project in Thailand and sets new standards of design, smart living and sustainability in the city.

Mitsubishi Electric's centenary

The Mitsubishi Electric Group is celebrating 100 years of technology and innovation. Over the past 100 years, Mitsubishi Electric has given everything to change the world for the better. And created many unique innovations and technologies in the process. Read the entire company history starting on page 60.

Cobot – with the abilities of an industrial robot

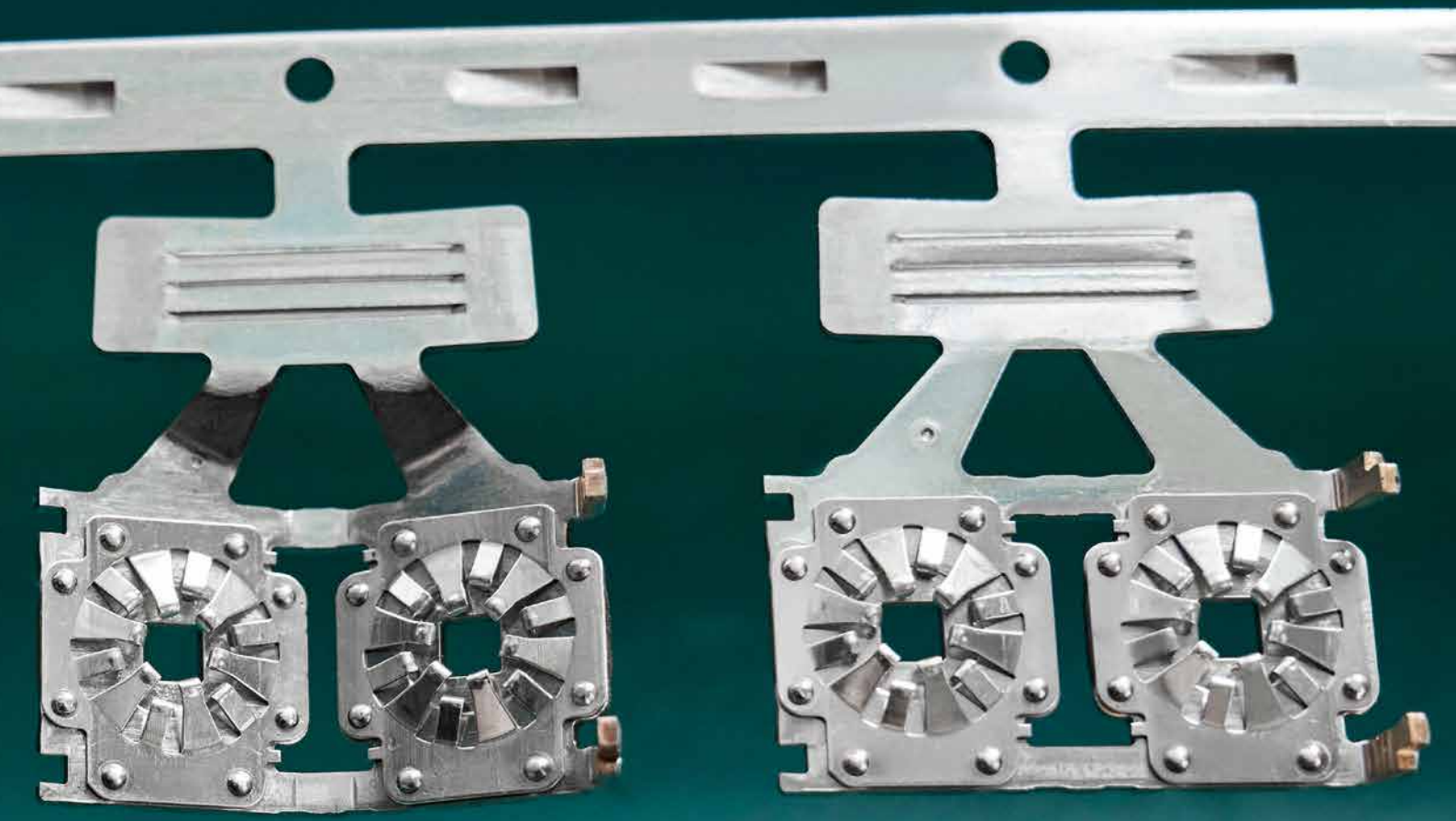
ASSISTA is the name of the new collaborative MELFA robot from Mitsubishi Electric. It is designed to work with human operators without the need for guards or safety enclosures. The new cobot now offers maximum safety and performance combined with easy operation and programming. What makes it so special is that it is in no way inferior to a standard robot in terms of precision and positioning accuracy.

Kleiner GmbH

3000 mm progressive die production.

Werkzeugbau Kleiner makes it big …

Wide range of components thanks to high vertical integration.



Punching specialists Kleiner GmbH in Pforzheim operate a large toolmaking shop for their own production activities and as a service to external customers. Thanks to their high vertical integration, they are capable of machining a wide range of components for high-quality punching tools. Wire-cutting on a Mitsubishi Electric MP1200 Connect has proved particularly effective. In unsupervised operations, the machine cuts almost all the functionally decisive components of a tool ready for installation from a single clamped plate.

Kleiner GmbH

Kleiner GmbH is one of several companies located in Pforzheim and environs, Germany's heartland for punching equipment. The company has been established for many years as a high-quality and expert supplier to the automotive and electrical industries, primarily with precision parts made from steel, copper and aluminium sheet. The products include, for example, intricate plug connectors for electrical systems in motor vehicles, which are produced in large series of several million units annually.

For this, Kleiner requires intricate punching tools, in most cases progressive dies with several integrated cutting and forming stages. The punching specialist in Pforzheim designs, makes and assembles these tools itself. For this purpose, it has a comprehensively equipped toolshop with currently about 60 employees. The company in Pforzheim covers the full range of services, from the optimisation of the punched components – usually in cooperation with its clients – and the design of the punching and forming tools to the production and assembly of the tools through to large-scale production on various automatic mechanical and hydraulic punching machines. Kleiner's portfolio ranges from single-stage punching tools that produce high-precision micro-components with diameters of only a few tenths of a millimetre, executed on punching presses with 5 t press force, to complex connectors produced in large series on progressive dies up to 3000 mm long on automatic punching presses with 250 t press force. "This huge spectrum makes us the ideal supplier to the electrical, automotive and electronics industries. We have a comprehensive understanding of punching and forming processes, and our activities range from toolmaking to serial punching production operations. This makes us the perfect single-source supplier. In addition, we can

PROGRESSIVE DIES UP TO **3000 MM** LONG

Comprehensively equipped toolshop.

AUTOMATIC PUNCHING PRESSES WITH 250 T PRESSING FORCE

also compensate for fluctuations in the economy. For example, we have been involved as experts in the development of electromobility right from the start," explains Christian Hamann, authorised signatory and head of tooling at Kleiner.

High vertical integration

For the toolmakers in Pforzheim, it is crucial to have and to be able to use all of today's commonly used machining processes. "This is the only way we can act flexibly, produce tools within the shortest possible time, rework them if necessary and thus keep our series production up and running," says Hamann. The machining techniques in Pforzheim include milling, HSC milling, turning, precision grinding, optical grinding, and die-sinking and wire-cutting EDM. "With our own wire EDM system, we are not dependent on subcontractors. We always keep pace with the current state of the art with this latest technology as well. Which is why we invested in an MP1200 Connect wire EDM machine a few months ago," Hamann continues.

He has been impressed by Mitsubishi Electric's services in every respect: "In consultation with the sales manager Hans-Jürgen Pelzers, we were first given a machine to try out. Our employees were able to use it in everyday operations to get to know its special functions and superior features. We then took over the MP1200 Connect after a few weeks – what better proof of our employees' enthusiasm for with the equipment and the way the MP1200 Connect works?"

More cost-effective and efficient

In the opinion of Kevin Block, NC programmer and machine operator in toolmaking at Kleiner, wire cutting is highly beneficial to the production process, especially in toolmaking: "We can combine several machining operations. With the wire, we can fully cut complex geometries and shapes directly in a single production step. This machining process often even takes place unattended in evening and night shifts, eliminating the need for cumbersome, multiple machining operations – with HSC milling and subsequent grinding, for example," he explains. This is why for the toolmakers in Pforzheim wire EDM usually proves more cost-effective and efficient than other machining processes. "Another advantage is that we can cut several components for a punching tool from

a single plate and are thus able to produce many components of a tool in just one production run," Block adds. For example, all the punches and dies for a progressive tool can be produced in a single process on the wire EDM machine. "We also benefit here from the accuracy of the MP1200 Connect. This is because we can machine contours extremely reliably with accuracy of a few micrometres and achieve an Ra surface finish of less than 0.1 µm, enabling us to finish-machine the most common components for punching tools ready for installation," says Block. The MP1200 Connect is ideally equipped with the standard SD-FS fine finishing generator for this purpose.

Unsupervised operation minimises costs

Block sees the machine's reliability and its automatic wire threading as further key features of the MP1200 Connect. "We can program a large number of components for a process sequence on the wire EDM machine. In supervised shifts, the NC programmes are transferred to the machine, which we set up accordingly and load with plate. This is a quick and convenient process thanks to the excellent accessibility of the workspace." The MP1200 Connect then machines the components unmanned. Block continues: "The automatic wire threading doesn't let us down and works with almost unbelievable reliability. This makes it one of the best features of the MP1200 Connect. We can count on all the programmed components being cut overnight, for example, thus ensuring maximum flexibility for us. Time wasted due to waiting and time-consuming reworking is eliminated and the finished components are immediately ready for further processing or assembly." At Kleiner in Pforzheim, NC programming for the entire toolshop is concentrated in one area. The NC programmers, says Hamann, benefit from the direct personal exchange of experience and the team's accumulated expertise. For wire EDM, all work steps and cutting sequences

Hugely reliable wire threading.

"Mitsubishi Electric's wire EDM machines meet the exact requirements of the punching tool industry and come with an unbeatable price/performance ratio."
Christian Hamann, authorised signatory and head of toolmaking

are defined at the CAD/CAM system. The machine operator simply enters a few parameters on the machine and launches the production process. "The neat layout of the large touch screen with APP icons supports us and simplifies operation. This innovative type of operation is particularly helpful for the younger employees," Block adds. The job scheduler that Mitsubishi Electric has integrated into the control system is also much appreciated: "This allows us to schedule different jobs for the night shift or weekend shift and plan how the MP1200 Connect is to work unattended." Thanks to the reliable automatic wire threading, the toolmakers can be sure to have precision-machined components at the start of the next supervised work shift. To ensure that there is enough wire for the required long cuts, the MP1200 Connect in Pforzheim has an extra

We also benefit here from ***the accuracy of the MP1200 Connect****. This is because we can machine contours extremely reliably with accuracy* ***of a few micrometres*** *and achieve an* ***Ra surface finish of less than 0.1 µm*** *...*

Kevin Block, NC programmer and machine operator in toolmaking at Kleiner GmbH

wire station for 20 kg wire spools. Block points out that the innovative drive system with Tubular Direct Drives and automatic collision monitoring on the MP1200 Connect also ensures dependable operation. “The risk of costly collisions with subsequent prolonged downtime and repairs, something that can always happen on wire EDM machines from other manufacturers, has been ruled out by Mitsubishi Electric,” he adds. He and Hamann agree that the MP1200 Connect from Mitsubishi Electric meets the needs of punching tool making to a tee.

Rapid pay-off

Hamann also stresses that he chose Mitsubishi Electric for economic reasons. In his view, the technical features of the MP1200 Connect are highly innovative, but rival machines also perform similarly well. However, the wire-cut EDM machines from Mitsubishi Electric prove to be significantly cheaper in terms of investment and operation. The price-performance ratio of the MP1200 Connect is unbeatable, Hamann confirms. He expects the machine in Pforzheim to pay for itself within a very short time.

Kleiner GmbH

Founding year

1985

Managing directors

Thomas Kleiner
Joachim Hartrumpf

Employees

250, with 60 producing punching tools

Core business

Toolmaking and punching, development and production of high-quality punching tools for the production of series components from steel, copper and aluminium sheet for external customers as well as for in-house production, punching of tiny and minute sheet metal parts, electrical contacts and connectors for electronics, and the electrical and automotive industries in large series

Contact

Göppinger Strasse 2-4
75179 Pforzheim, Germany

Tel +49 (0) 7231 6072-0
Fax +49 (0) 7231 6072-1039

info@kleiner-gmbh.de
www.kleiner-gmbh.de

Free know-how for you to back order – as long as stocks last.

Back issues

and change of address.

Back Issues

Yes, I'd like to order back issues of the following ***Profile*** magazines (please enter desired number):

Current issue _____ 01/20 _____ 02/19 _____ 01/19 _____

Address/ Change of address

Company

Surname | First name

No., road

Post code | Town, country

Email address

Phone

Yes, I would like Mitsubishi Electric to keep me informed of its special offers and campaigns by email.

Date, signature

Note: Your data will not be passed on to any third parties except companies involved in the processing of your order. You can terminate the storage of your personal data at any time by simply sending a fax to +49.2102.486 7090

MITSUBISHI ELECTRIC EUROPE B.V.
Mechatronics Machinery / Profile Reader Service
Mitsubishi-Electric-Platz 1 / 40882 Ratingen / Germany

Order by fax
+49 (0) 2102 486-7090

Order online
www.mitsubishi-edm.de/profile

From practitioners for practitioners.

Toolmaking overview

Which solutions are proven in the field?

Prototype construction
Series production
Mould making
Toolmaking
Large parts
Precision parts
Contract manufacturer
Machine

Stammberger Werkzeugbau	✓	✓		✓	✓			MV1200S MV4800S	
Ing. Lang & Menke	✓			✓				4 x MV2400R Connect	Progressive dies and bending tools
Kreyenberg	✓					✓		MV2400R EA28V Advance	Plastic injection moulds
TROB Präzisionsfertigung	✓			✓		✓	✓	MP1200 MP2400	Stamping tool and fixture construction
Naton Kft.	✓					✓		FA10VS MV2400S NewGen 2 x EA28V	Die casting moulds, plastic injection moulds and sheet metal forming tools
Neubeck & Wiedemann	✓			✓		✓		MV2400S MV2400R Connect	Stamping tool and fixture construction
Fischer	✓							MP1200 MV2400R	Injection moulds
Jehle AG	✓		✓					2 x MP2400 Connect	
Wachsmuth & Co.	✓						✓	MV4800S FA20S FA20S Advance	
Legrom	✓	✓				✓		MV2400S NewGen	Injection moulds
K-L Präzision Falk Lange	✓	✓				✓		NA1200, MV2400R 2 x MX600 EA28V Advance and more	
Rohde & Schwarz Werk Teisnach	✓					✓		MP1200 Connect MP2400 Connect	Stamping/bending tools and micro injection moulds
Bacher GmbH	✓		✓	✓				MV1200R MV2400R	

Link to the report
www.mitsubishi-edm.de/en/xxx

Scan in the code and read the full report

Focus	
	www.mitsubishi-edm.de/en/101
Production of high-quality stamped and formed parts	.de/en/102
Plastics processing Precision toolmaking	.de/en/103
High-precision and difficult-to-produce parts	.de/en/104
	.de/en/105
	.de/en/106
	.de/en/107
	.de/en/108
Toolmaking for packaging equipment	.de/en/109
Fabrication of rolling element cages	.de/en/110
	.de/en/111
Machining of sheet metal	.de/en/112
	.de/en/113

Halter AG Frutigen

Keeping intruders at bay.

The Swiss love precision when it comes to lock cylinders as well.

Cylinder locks are the usual means of protecting front doors from burglary. Widely used are the “classic” cylinder designs with the familiar serrated profile of milled grooves on the underside. Known for their love of precision, the Swiss often prefer more elaborate designs with flat reversible keys for this purpose. With stepped holes on the front and rear, these activate more locking elements than serrated keys. In still more elaborate versions, such a key can also activate additional locking elements with the narrow side and even with oblique milling.

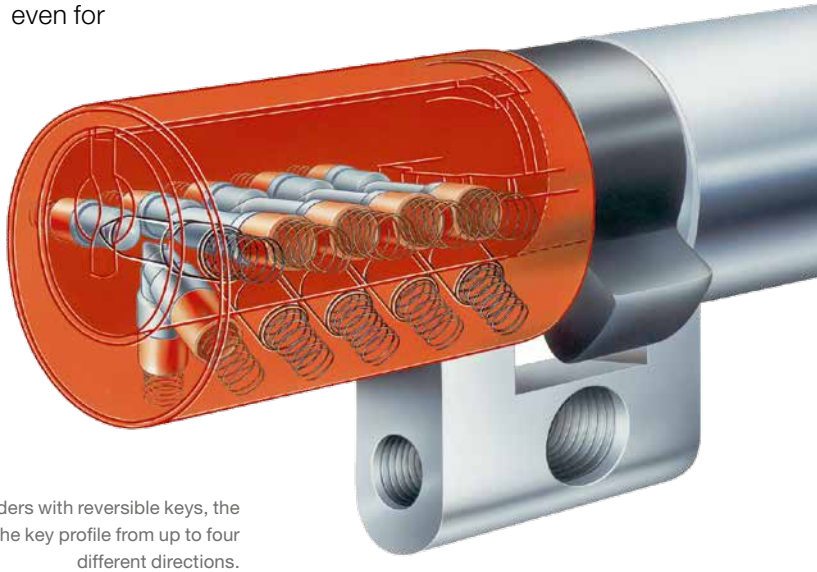
The lock cylinders are fully automatically machined in a robotic cell.

”The company was originally founded by my grandfather near Basel in 1946 and initially manufactured precision mechanical components for manufacturers of pairs of compasses,” recalls Pascal Halter, Dipl.-Produktionstechniker HF Maschinenbau (Swiss qualification as a production technician in mechanical engineering), Technical Manager of Halter AG in Frutigen (Switzerland). After relocating from Binningen (BL) to Frutigen in 1969 and the erection of a new building in 1973, the production portfolio was expanded to include parts for lock cylinders and ultimately to the manufacture of complete lock cylinders. At the same time they also took over an automatic lathe shop whose production programme included drilled and turned parts. The production activities here were steadily extended to include milling and other additional specialised machining operations. This is also where some of the components for lock production are made.

Since then, the company has grown organically on these two pillars – lock cylinders and bar-turned parts – to its current size of 45 employees. The two product groups account for roughly equal shares of sales and earnings. Since 2015, it has been cooperating closely with Glutz, whose core competence lies in electronic access systems. Since then, the two companies have been selling each other’s product ranges and have thus significantly expanded their market coverage.

Precision locks made entirely to order

”Our flagship product First Alpha features up to 20 pairs of pins of different lengths and positions, thus ensuring the highest level of security,” Halter adds. While standard lock cylinders are assembled from up to 80 individual parts, the Alpha versions have up to 120. In addition, additional oblique holes milled with great precision ensure that attempts to ascertain the pin arrangement from the outside are doomed to failure from the outset. The large number of pins makes it possible to produce highly complex locking systems, even for



In high-quality lock cylinders with reversible keys, the locking elements probe the key profile from up to four different directions.

Complex locking systems, even for large buildings.

LOCK CYLINDERS FROM
120 INDIVIDUAL PARTS

large buildings. Thanks to the keys' tight manufacturing tolerances, attempts to copy them are usually destined to fail. A security code for each key and a security certificate with the owner's personal signature are stored at the plant, thus providing the best possible protection from unauthorised reordering.

Broad range of customers

"Our clientele for lock systems is highly diversified and ranges from architects and building contractors to carpenters and private individuals. The sale of our products is reserved for specialist dealers and locksmiths," says Halter. Instead of mass-produced items, the company focuses above all on flexibility in fulfilling customer wishes. This also includes the production of special designs with extra-long cylinders, for example, or adapting them to the installation conditions on site. In such cases, too, the company also produces even small and very small series sizes down to one-off items. As a medium-sized company, the company is also quick to respond to such orders with rapid production and delivery. The company also benefits from its own engineering department with specialists who can draw on extensive experience in the realisation of similar applications.

The use of EDM

"We mainly use EDM for special jobs such as the production of tools as well as key blanks with special dimensions," says Halter. The key blanks are made of corrosion-resistant nickel silver. Stamped parts are obtained for standard sizes, while for special sizes the outline is cut by spark erosion. Here, plate of the required

Monitoring the currently running program for the production of special snap rings

We're happy with the equipment supplied by Mitsubishi. If for some reason we had to purchase a new wire EDM system, we would choose this make again.

Pascal Halter
Dipl.-Produktionstechniker HF Maschinenbau

thickness is stacked in packs of 20 and then cut using wire EDM. In addition, wire EDM is used for the production of special parts such as special snap rings, jigs and fixtures, and gauges. A variety of steels, including tool steels and HS steels, are used for this. For these tasks, the company purchased its first wire EDM system from Mitsubishi Electric in 2005. Deionised water is used as the dielectric. This machine was in successful operation until 2018 when there was unfortunately a serious fire in the machine shop, which caused considerable damage. Although the wire EDM machine itself was spared immediate damage, it was heavily exposed to fumes, which resulted in frequent malfunctions and failures. Production was maintained thanks to the excellent after-sales service, but the machine became uneconomic due to the accumulating issues. It was therefore decided in the following year to scrap the existing machine and replace it with a new one.

Mitsubishi Electric chosen again

"For this procurement, we again opted without

The Mitsubishi Electric MV1200S NewGen wire EDM system purchased in 2019 replaced a predecessor machine impaired by the after-effects of a fire.

much deliberation for a Mitsubishi Electric system," says Halter. They were already satisfied with the performance of the first machine and the support provided by the manufacturer and realised they could depend on the skills of the technicians sent from Germany during the frequent breakdowns after the fire. The employees were also familiar with the operation of the system and its programming. If they had opted for a different brand, they would have had to throw out the numerous machining programmes already in place. With the new machine, the commissioning and training of the employees also went very well, and the new MV1200S NewGen runs just as reliably as its predecessor before the fire. "We're happy with the equipment supplied by Mitsubishi. If for some reason we had to purchase a new wire EDM system, we would choose this make again," says Halter, summing up his experience.

Not only tourism: as is typical of Switzerland, Frutigen, with its population of just under 7,000, is also home to high-performance precision manufacturers in such fields as lock manufacture, hydraulics and ski bindings.

Halter AG Frutigen

Employees
45

Founding year
1946

Management
Dario Halter (Managing Director)
Pascal Halter (Technical Manager)
Jasmin Halter (Head of Administration)

Core business
Lock systems and bar-turned parts

Contact
Schwandistrasse 27
3714 Frutigen, Switzerland

Tel +41-33-672-1000

info@halter.ag
www.halter.ag

Mitsubishi Electric partner for EDM systems in Switzerland
Josef Binkert AG
Grabenstrasse 1
CH-8304 Wallisellen, Switzerland

Tel +41 44 832 55 55
Fax +41 44 832 55 66

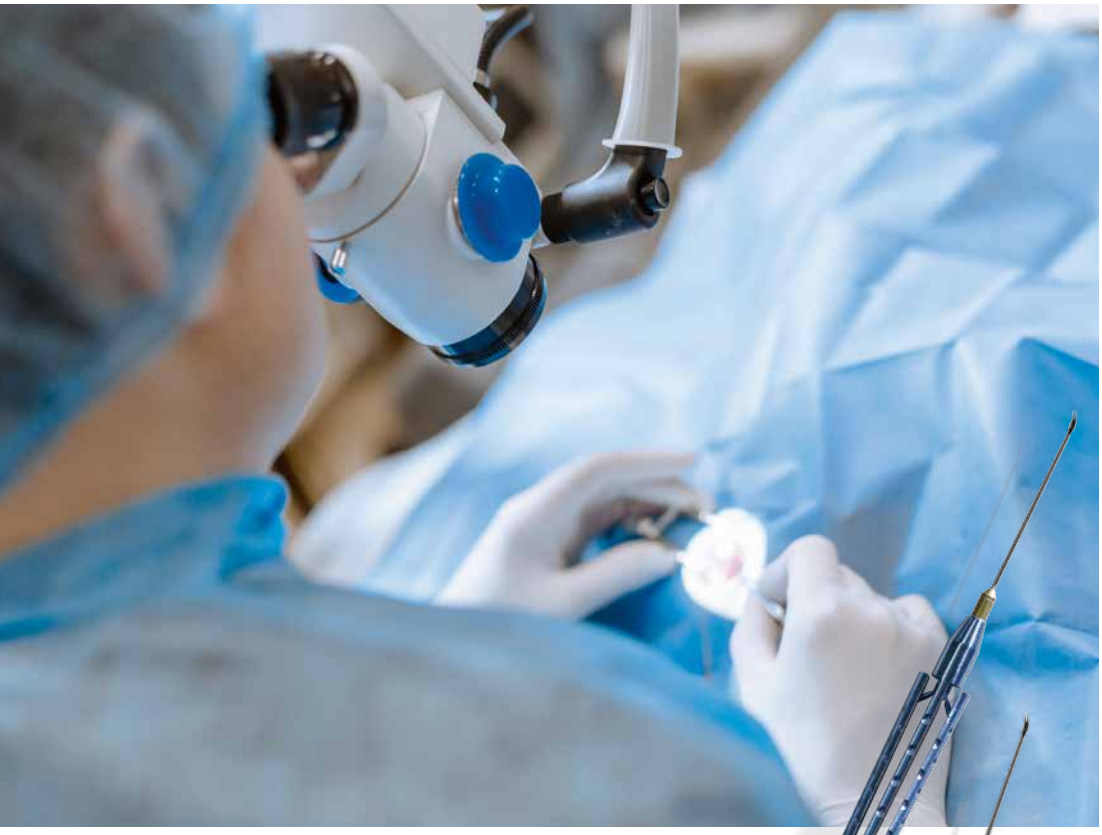
info@binkertag.ch
www.binkertag.ch

Plenty of expertise for high quality.

For 100,000 eyes.

Micro-precision in series.

Jansen Precisie Techniek proves that wire erosion is not just a process for one-off production, as it produces, among other things, precision parts for microsurgical instruments in quantities of up to 100,000. The reproducibility of high quality in particular requires a good deal of expertise.



80%

CHANCE OF THE SURGICAL INSTRUMENT FOR **OPHTHALMIC SURGERY** BEING **EQUIPPED** WITH A PART MANUFACTURED **BY JPT**

Operations on the eye call for absolute precision. A vitrectomy, for example, may be necessary in the event of diseases of the macula or retina. Here, the interior of the eye is accessed via minimal incisions behind the edge of the cornea. So that these do not have to be sutured after the operation, they are tiny, less than one millimetre and sometimes even less than 0.4 millimetres long. Via these incisions, the surgeon inserts minute surgical instruments and lighting devices into the eye.

Market leader in eye surgery

Anyone who has ever had such a surgical operation performed on their eye has probably experienced a product from Jansen Precisie Techniek (JPT) in action: ”There’s an 80 per cent chance that the surgical instrument is equipped with one of the parts we make,” says Mark Jansen, director and owner of the Dutch company domiciled in Borculo. The small company with 14 employees supplies Europe’s leading manufacturers of ophthalmic surgical instruments with precision parts. Vitrectomy knives in particular are an important product for Jansen, as his company produces up to 5,000 of them per week. JPT employs two MP1200 Connect wire EDM machines from Mitsubishi for this purpose. ”The machine operates with 0.05 millimetre erosion wire as standard and is thus an excellent addition to our machine park. It also delivers the surface roughness we need for the medical instruments,” says Jansen. The fine finishing generator (SD-FS), installed as standard in the MP1200 Connect, permits a suitably high-quality finish – down to Ra 0.05 µm on carbide. Jansen often cannot really measure the roughness, however, because the components are far too small for the surface to be checked with a probe: ”For us, the goal is ’as smooth as possible’. Because the parts we produce are all viewed by the end user under the microscope – namely during eye surgery. No surgeon wants to see wire grooves on the knife, for example.”

Virtually zero variation for ultra-fine parts.

Top quality for successful interventions

For eye operations, surgeons use special microsurgical ophthalmic instruments. Similar instruments are also used for operations on the thorax, the nervous system or the brain. The tolerances or variations in the precision-engineered mechanical metal parts and components used in these instruments must be practically zero. The ISO 13485 standard, to which JPT manufactures its instruments and which forms the basis of the company's modus operandi, assures quality of the highest level.

Wire EDM in automated series production

But Jansen has this precision under control, even in automated operation: "It's widely held that wire EDM machines are more something for one-off production or for work in research and development," says Jansen. "But we demonstrate that automated series production, in some cases even with robot loading, is also possible with them." But this requires expertise – which the company has amassed over a period of 40 years. Back in 1981 and still under the management of Jansen's father, the company acquired its first EDM system. At that time, it was used for producing punching tools, because the company was originally a tool grinding shop. The next EDM machines soon followed, already equipped with 0.03 millimetre EDM wire. This marked the beginning of the production of tweezers for medical applications. When Mark Jansen finally joined the company in 2006, he laid the foundations for the future, as he no longer saw any prospects in tool grinding: "More and more of our former customers now have wire EDM machines of their own, so, starting in 2010, we shifted our focus to medical technology." Thus, the company has also been certified to ISO 13485 for medical applications since 2012. Today, components for medical instruments – for tweezers, forceps and miniature scissors – make up the bulk of the production volume, but Jansen also manufactures precision parts for the watch industry and operates as a subcontractor. One die-sinking and nine wire-cutting machines are in production for this purpose, with batch sizes ranging from 50 to 100,000 units.

Clamping expertise

"What really counts with such volumes is that we can repeat the high precision and quality over and over again for each part," says Jansen. Mitsubishi Electric's MP1200 Connect delivers the necessary prerequisites for this. The heavy-duty machine bed and linear guides, whose slides are designed with backlash-free bearings, ensure the

Watch components produced in series.

Company history

1975

Founding of Slijpservice Lochem B.V. and launch of tool sharpening business.

1981

Jan Jansen joins Slijpservice Lochem B.V.; this is followed by the purchase of the first spark erosion machine (the largest in the Netherlands at the time). This heralds in a new era; the company now embarks on a new activity, that of precision machining.

1991

The company is taken over by its own management; the owner of Slijpservice Lochem B.V. is now Jan Jansen.

2004

Start of the manual sealing of capillaries

2010

Change of name to Jansen Precisie Techniek (JPT) and expansion of activities to rest of Europe

2012

The company is proudly certified to ISO 9001 and ISO 13485 (medical applications).

2013

Products now supplied worldwide. Commissioning of the new optical 3D-Scope-Check measuring machine with CNC operation from Werth.

2014

Business taken over by Mark Jansen. Launch of micro-laser welding.

2019

Purchase of two MP1200 Connect wire-cutting machines. Reproducible quality even for the thousandth part.

2020

Workforce extended to 14 committed professionals

Reproducible quality even for the thousandth part.

smoothest possible running and thus precise EDM results in the long term. Above all, however, the repeatability of precision is all down to the clamping: ”The machines basically master the required precision, and there’s nothing magical about programming them. But fixing the parts on the machine in such a way that the quality can be reliably reproduced even on the thousandth part calls for a lot of know-how,” Jansen stresses. That’s why all the fixtures at JPT are designed and built in-house. The closed four-sided table of the MP1200 Connect provides a solid basis for this, making it easy to set up the clamping devices. Jansen has managed to optimise the threading of the wire – the company mainly uses 0.03 millimetre wire and EDM wire in the 0.05 and tenth of a millimetre range – and abrasion so that wire breakage is a rare occurrence. An important prerequisite, since the machines run unmanned in automatic mode at night.

The workspace, fully accessible thanks to the lowerable tank, makes set-up so much easier.

Adviser to the customer

However, this requires appropriately designed components that are machined on the machines. ”For each new job or product, we always aim to simplify production and cut costs,” says Jansen. ”We are always looking for the best solution for the customer – even if it turns out that wire EDM is not the right process.” Jansen has therefore supplemented his machining capabilities with micro-laser welding systems; if necessary, he passes the order on to companies from his partner network – specialists in deep drawing, for example. ”But we also handle the entire production process ourselves, assembling part components, for example, if desired”. Jansen employs goldsmiths and watchmakers, among others, who have the necessary manual dexterity to assemble these fine precision parts.

Certification of processes and machines

All work steps, processes and machining methods are certified – firstly to ISO 13485, and secondly by JPT’s customers, the manufacturers of the medical micro-instruments. This validation even extends to the clamping and the machine used. ”When we bought the two MP1200 Connect from Mitsubishi Electric, we also had

Optical quality control under the microscope.

intention to buy," says Jansen. After three production and test runs, the two machines were finally certified and have been working reliably and precisely since 2019.

"We will continue to expand our wire EDM capability," says a confident Jansen – even though he wants to build on his laser welding capacity this year. "But after that we will push ahead with the automation of the two Mitsubishi Electric machines." He's considering positioning an articulated-arm robot between the two MP1200 Connects so that it can load both machines. It's a good thing that the EDM machines of the MP series from Mitsubishi Electric are automation-ready, as this means that handling systems and robots from a wide range of manufacturers can be seamlessly integrated.

to go through this process," Jansen adds. "Mitsubishi Electric helped us to modify the machines in accordance with our requirements and assisted us with the necessary validation by the customer." For example, Mitsubishi Electric made an MP1200 Connect available to Jansen at the Technology and Demonstration Centre in Ratingen for two days so that they could perform test cuts on it with the planned product. "This showed us that the basis was right and we notified our customer of our

The tiniest components in series – typical of JPT

JPT
Jansen Precisie Techniek

Founding year
1975

Management
Mark Jansen

Employees
14

Core business
Development and manufacture of precision mechanical components and assemblies. Manufacture and testing of high-precision metal parts for medical applications.

Contact
Korenbree 18
7271 LH Borculo, Netherlands

Tel: +31 (0) 545-271551

www.jansen-pt.com
info@jansen-pt.com

Mitsubishi Electric partner for EDM systems in Netherlands:
Dymato BV
www.dymato.nl
info@.dymato.nl

Robotic support for two machines.

The machine operates with 0.05 millimetre erosion wire as standard and is thus an excellent addition to our machine park. It also delivers the surface roughness we need for the medical instruments.

Mark Jansen,
Owner and Director of Jansen Precisie Techniek

Jansen Precisie Techniek

Winkler Präzisionswerkzeuge GmbH

Grinding and honing are so 2017.

All in one go with the MP1200 Connect.

Instead of tedious and laborious milling, turning, grinding, lapping and polishing, Winkler Präzisionswerkzeuge GmbH in Lauffen am Neckar exploits the potential of wire-cut EDM production engineering. On an MP1200 Connect, the specialists produce backlash-free mating slides for grippers and clamping systems with micrometre precision.

Since its takeover by Schunk GmbH & Co. KG, a neighbouring specialist in gripping and clamping technology, Winkler's subcontracting business has been thriving. Using all the usual machining processes, such as drilling, turning, milling, grinding, honing and lapping, the company specialises in producing precision components to order for the general machine building sector and the automotive industry. This mainly involves customised special components from drawings, such as for jigs and fixtures, clamping devices and robot grippers. Demand for precision components has improved significantly, largely due to recently redoubled efforts to expand automation in the machine manufacture sector. Patryk Hoff, authorised signatory and plant manager in Lauffen, says: "Our success is mainly due to our exceptional high vertical integration. Customers appreciate that they can get fully machined workpieces ready for installation from a single source." The Lauffen job shop also flexibly organises the hardening and coating of the finished components at short notice in close cooperation with neighbouring companies.

Winkler mainly manufactures one-off items and small series. "We also produce a few selected components in larger series amounting to several thousand workpieces per year," Hoff adds. In addition, Winkler also builds complete assemblies from various components. The contract manufacturer often cooperates with the client right from the development and design stage. This way, they can use their extensive experience in manufacturing to optimise the components, to enable them to be produced much more economically, for example.

Investment creates opportunities

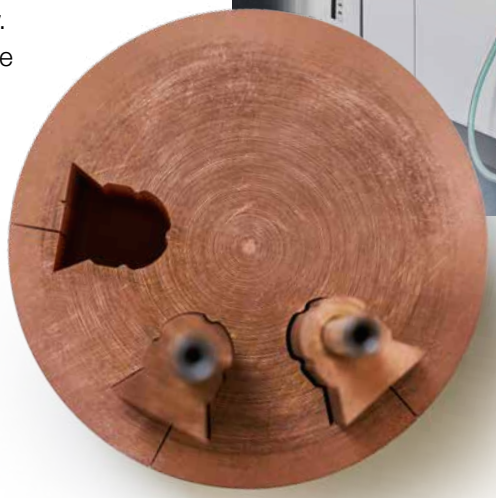
In 2017, the subcontractor was completely taken over by gripper and clamping equipment specialist Schunk. However, Hoff tells us, the company has remained largely independent and self-sufficient in terms of its customers and contractors. This means that it is still able to work on a contract basis for all companies in the machine construction sector. "Contrary to initial fears," Hoff continues, "being part of a large parent company has proven to be a huge blessing. We are now in a much better shape financially and have been able to invest heavily over the past three years." During this period, the job shop purchased an MP1200 Connect wire-cut EDM machine.

Huge boost in demand.

Precision without reworking: With the MP1200 Connect, sliding fits can be wire-cut to an accuracy of 1 µm.

High machining accuracy.

This has firstly expanded existing production capacity. “In addition, we are now capable of machining precision parts with high accuracy at very low cost,” Hoff adds. He cites a mating slide with a design similar to a dovetail joint. Using wire EDM alone, the specialists in Lauffen machined both the convex and concave profiles to an accuracy of roughly 1 µm. The profiles mate exactly without play and can still be pushed over each other easily and almost without force. “Manufacturing these profiles by milling, grinding and lapping would be far too time-consuming and labour-intensive,” says Hoff. That’s why he and his skilled workers machined the profiles on the MP1200 Connect wire EDM system. “We managed to do this effortlessly with micrometre accuracy. The profiles are perfectly aligned and mate without any reworking, thus underline the high machining accuracy of the wire EDM machine from Mitsubishi Electric,” Hoff stresses. This level of accuracy would not be possible on rival machines. “That tipped the scales in favour of Mitsubishi Electric and the MP1200 Connect.” On the MP Connect, the SD-FS digital fine finishing generator is also always available.



jobs, especially from our parent company, and lays the foundations for further growth,” he adds.

Manufacturing these profiles by milling, grinding and lapping would be far too time-consuming and labour-intensive […] We managed to do this effortlessly with micrometre accuracy. [...] This underlines the high machining accuracy of the wire-cutting machine from Mitsubishi Electric.

Patryk Hoff, authorised signatory and plant manager at Winkler Präzisionswerkzeuge GmbH

Extended capacity

The MP1200 Connect has thus expanded the contract manufacturers’ capacity not only in terms of the quantity of components machined, but also in terms of the type of precision parts. It is now possible, says Hoff, to reliably produce high-precision parts with difficult, complex geometries with rapid throughput and, more importantly, mostly with low staffing levels. “This brings us additional

In the few months since the MP1200 Connect has been running in Lauffen, numerous other advantages of the wire EDM technology from Mitsubishi Electric have revealed themselves. For example, the job shop technicians are highly satisfied with the reliable wire threading, as it enables them to arrange multiple workpieces on larger fixtures and have them fully machined in unmanned night shifts. Thanks to the innovative Tubular

In comparative tests, this wire-cut EDM system proved to be the only one capable of meeting our demands for high-precision machining to roughly 1 µm.

Patryk Hoff, authorised signatory and plant manager at Winkler Präzisionswerkzeuge GmbH

Shaft Motor technology, this can be done even faster than on rival wire-cut EDM machines, Hoff confirms. In addition, the spacious workspace is very accessible thanks to the fully lowerable tank. It is possible to fully open the housing and lower the table, allowing machine operators to comfortably reach into the workspace from three sides, quickly load the machine with heavy plates with ease and remove the finished components.

The right choice

Hoff also appreciates the advantages of the MP1200 Connect in terms of its operational strategy. He notes that younger operators in particular appreciate the graphic user interface, comparable to the look and feel of a current smartphone. “Thanks to the large touch screen and the arrangement of the operating elements as APP graphics, it didn’t take us long to learn how to programme the machine correctly and use it productively,” says Hoff.

The workpieces are usually programmed on an external Solidworks CAD/CAM system and the CNC programs are generated with the CAM Works software. The programs are transferred to the MP1200 Connect via data line. There, the operator adds the optimal working parameters and starts the production process. Since the wire-cut EDM machine is extremely reliable, it can also operate unsupervised into the night. For longer operation, it has an additional wire station for 20 kg wire spools.

Hoff sums up his positive experience: “The MP1200 Connect machines with the high accuracy we demand and meets our requirements downs to the ground. It has demonstrated its dependability and is easy and reliable to program and operate. It’s really brilliant. We have chosen precisely the right wire EDM machine and we couldn’t be happier with it.”

Winkler Präzisionswerkzeuge GmbH

Founding year
1976

Managing director
Jochen Ehmer

Employees
45

Core business
Production of steel and aluminium precision parts for jigs & fixtures, clamping and gripping equipment, and for general automation in machine construction and the automotive industry

Contact
Im Brühl 64
74348 Lauffen am Neckar, Germany

Tel +49 7133 - 974400
Fax +49 7133 - 9744099

post@winkler-gmbh.de
www.winkler-gmbh.de

Optimal working parameters.

Brief interview with Patryk Hoff:

How has the situation associated with the COVID-19 pandemic affected business?

Hoff: In 2020, there was indeed an initial decline in incoming orders. But the situation had recovered appreciably by November. We are evidently benefiting from the fact that businesses are investing in automation even under difficult conditions.

What are you doing to cope in the present situation?

Hoff: We are continuing to build on our company's unique selling propositions. We aspire to top quality and precision and are convinced that this will enable us to set ourselves apart even in difficult times and to stay one step ahead of the competition. Our investment in the MP1200 Connect from Mitsubishi Electric underlines our strategy. In comparative tests, this wire-cut EDM system proved to be the only one capable of meeting our demands for high-precision machining to roughly 1 µm.

What consequences of the pandemic do you see for your business going forward?

Hoff: We will always be a reliable partner to the local precision engineering industry in particular. In close cooperation, we can provide our customers with expert support in the realisation of precision parts, from development and design through to production and assembly. We maintain contact with companies in the region and are available at short notice. We are also convinced that there will be above-average demand for high-quality machines and automation technology in Asia and especially China. High-tech from Germany is appreciated there. We see this as a solid basis for successfully developing our business in the coming years.

Top quality product range.

Winfried Keine Metallverarbeitung

High vertical integration saves time and cuts costs

Specialist for almost 50 years in finished parts that require no reworking

Frank Keine is an avowed advocate of quality and reliability. The managing director of Winfried Keine Metallverarbeitungsges. mbH founded in 1973 knows how his company can make an impression on its customers. For some 50 years, Keine has been concentrating on the production of stamped and bent parts and made a name for itself in its market segment. “We’ve specialised in finished parts that don’t need any subsequent reworking,” Keine explains. “Our product range extends from simple to complex stamped/bent subassemblies and assembly parts of the highest quality.”

Automated production of fully assembled products

It is important to the company in Finnentrop-Heggen in North Rhine-Westphalia that the parts no longer have to be reworked and augmented after leaving the machine. However, automated production is usually complex. In addition to the stamping and bending work, components have to be precisely fed into the process and assembled at tenth-of-a-second intervals. ”Without the monitoring of all production steps, such automated processes are out of the question,” Keine claims.

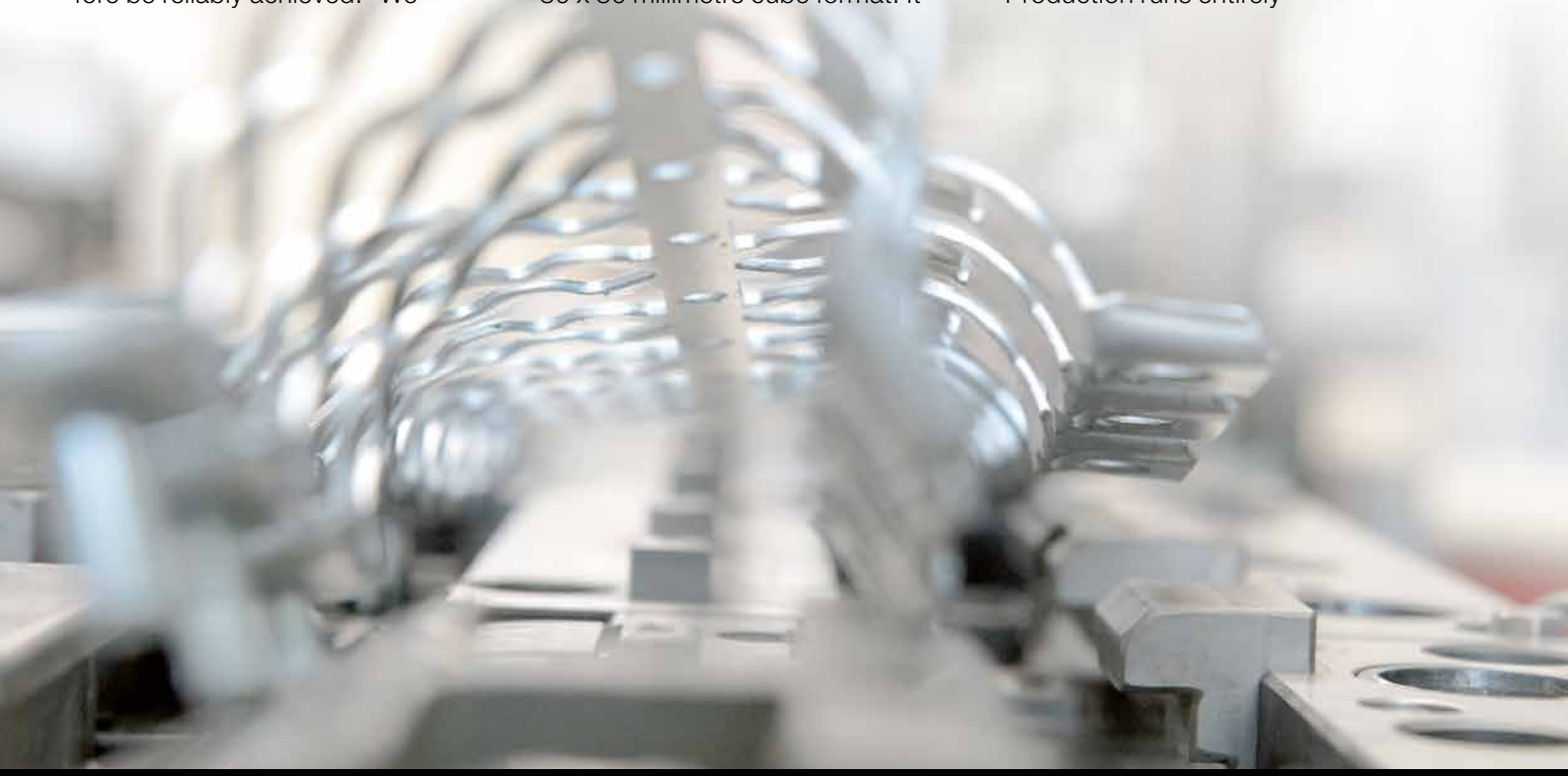
This type of production has a lot going for it. Top of the list are high quality and significantly lower costs. In addition, automated production also saves time, because the products leave the machine fully assembled, without any need for further finishing. Customers from the automotive industry in particular appreciate these self-contained processes for fully finished parts, as they eliminate human assembly error. Extremely high quality standards can therefore be reliably achieved. ”We concentrate on the German market,” says Keine. ”Some of our products safeguard the function of side airbags, while others can be found in exhaust gas recovery systems in numerous vehicles.” Keine’s customer base also includes reputed manufacturers of fire protection systems and hydraulic hose couplings for the mining industry. And manufacturers of so-called white goods such as washing machines appreciate products from Keine.

Batch sizes from 10,000 and upwards

The company specialises in the production of parts up to the 80 x 80 x 80 millimetre cube format. It machines all common materials, starting with copper and aluminium and extending to steel, spring steel and stainless steel in thicknesses from 0.3 to 3 millimetres. Together with its supplier of feed systems, the company has developed strategies to make smaller series economically viable. Nevertheless, these are among the exceptions, because, says Keine, ”we always have to keep costs within acceptable bounds. As a rule, our series production starts with batch sizes of over 10,000.”

Quality assured with sensors, test stations and random sampling

Production runs entirely



High quality standards – reliably achieved.

automatically. Each work step is monitored by a multitude of sensors in order to ensure high quality. Test stations after all key work steps also check each part for defects, completeness and assembly errors. Quality control also includes targeted random sampling, where the parts are finally scrutinised and checked for dimensional accuracy. ”We deliver the highest quality; ’complaint’ is not part of our vocabulary,” Keine proudly states. ”This gives us and our customers the decisive competitive edge.”

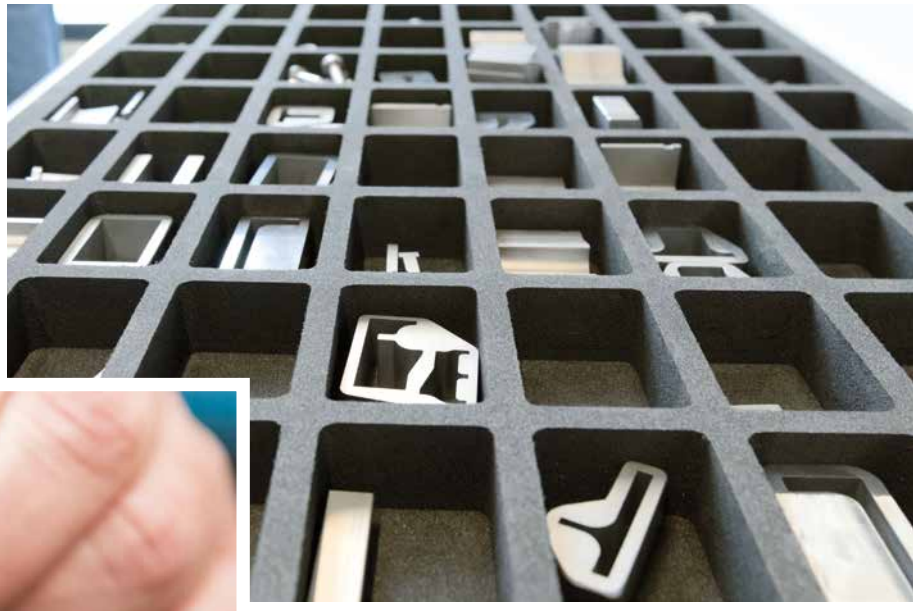
Precision products thanks to high vertical integration

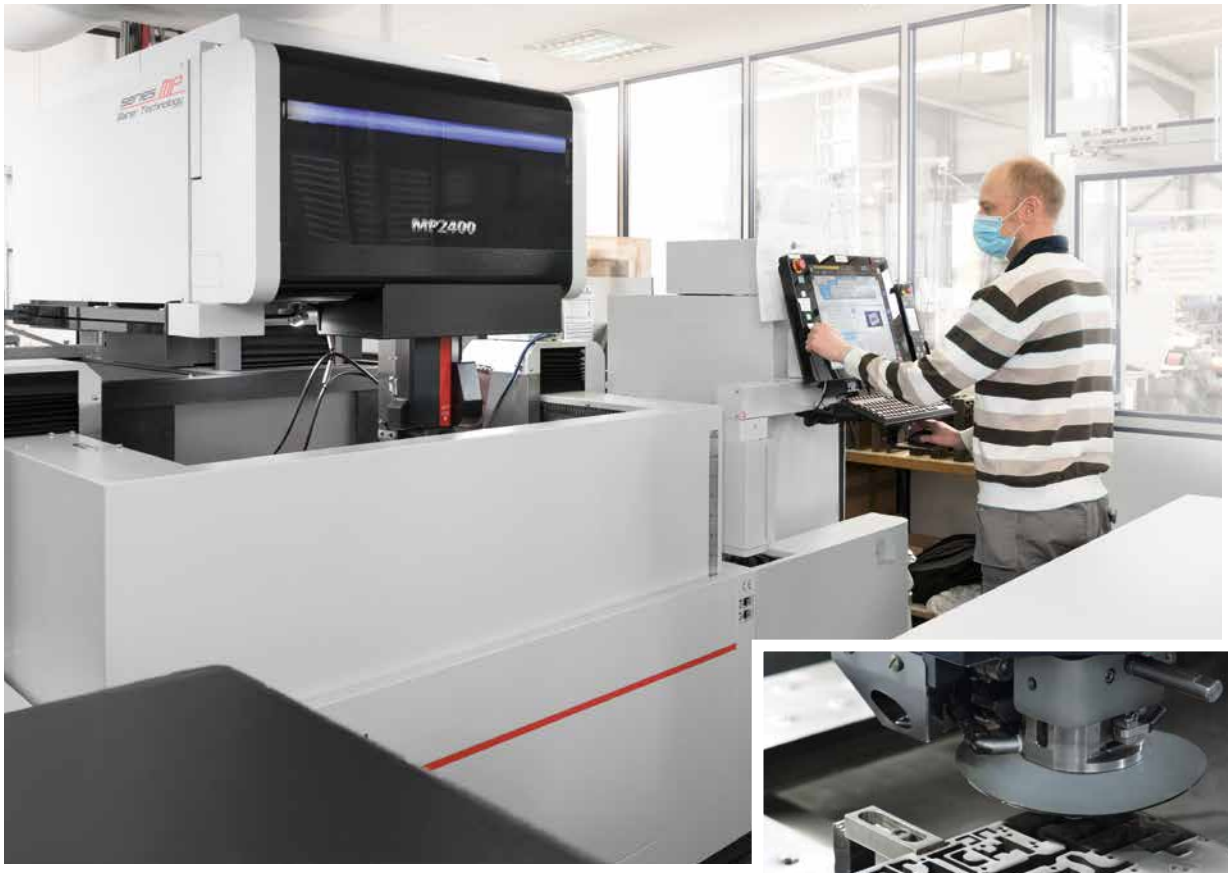
On the German production scene, Keine occupies a prominent position with its high quality standards. And it has worked hard to achieve them, the managing director stresses. In addition to the firm’s comprehensive expertise and innovative designs, its production quality is underpinned by two other factors. Manufacturing precise products calls for high-precision production technology and outstanding high-performance feed equipment. For Keine, it is also necessary that all the key areas closely interlock and run smoothly.

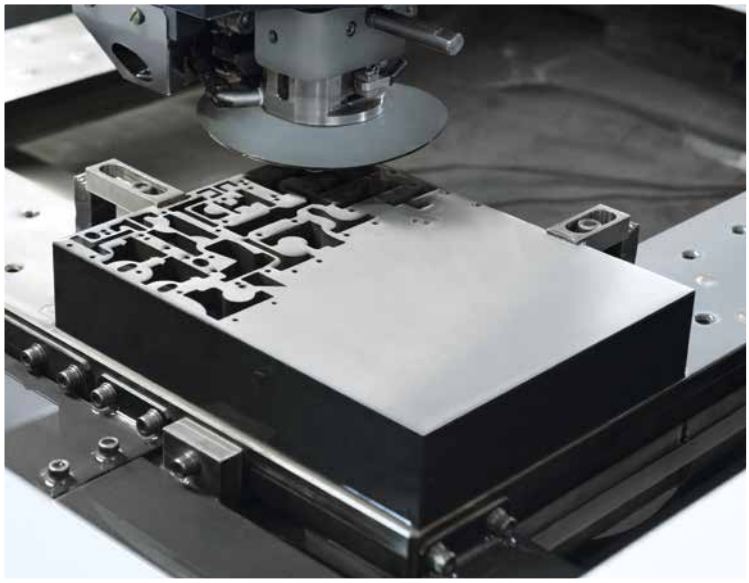
”In view of this,” says Keine, ”there’s no alternative to high vertical integration. I believe that it is essential that we can handle all the essential tasks, such as toolmaking, in-house. This way we have very short distances at all levels and are able to coordinate everything at high speed for the benefit of the customer.”

Indispensable in-house toolmaking

Alongside production, toolmaking occupies a key position. Directly linked to production, it facilitates the precise adjustment and fine tuning of the entire manufacturing process before the machine. ”This fine-tuning has got to work. This is where we have the highest expectations of both the tools and the feed system.” Coordination between the machines, the toolshop







and the feed systems is central to this. Keine considers his company's own toolshop to be indispensable. Repairs can be performed quickly and without holding up production. The entrepreneur also sees huge benefits in in-house maintenance and servicing work. With its own toolshop, the company always has both costs and timing under control. "Important here too," says Keine, "is of course the quality of the tools. We develop and make our tools in-house and can build them exactly the way we want them. And our success vindicates our approach."

Wire EDM since 1984

Since its founding, toolmaking has been an integral part of the company. EDM, milling and grinding are the machining methods that Keine needs for the production of its stamping and bending tools. The modern machinery is configured accordingly, with constant investment in new technologies.

"Two years ago, we took a close look at the market for EDM machines," Keine reports. "Up to that time, we had had two mid-range machines. To respond to our changing customer structure, we wanted to modify the machine park to comprise one mid-range machine and one in the upper segment." In their analysis of the competition, Keine's specialists found that some manufacturers use different control systems for mid- and upper-range machines. This is something that can result in higher training and familiarisation costs and higher error rates.

"This was where we were highly impressed by Mitsubishi Electric because they use a single control system for both machine brackets," Keine explains, "and then Mitsubishi simply won us over with their consulting expertise and price quotation. We opted in the end for two identical machines in the upper segment."

Advanced machine park.

Customers' growing quality aspirations

The company's investment in two identical machines is particularly advantageous in terms of job scheduling, as the machines' workload can always be optimised without compromising on quality. In addition, it is easier for the company to stock up on wear parts. "Although we usually machine small workpieces," Keine explains, "we still decided on the 2400 machines. This way we can clamp several workpieces at the same time and achieve cost-effective machine operation in unmanned shifts or at weekends."

With its two Mitsubishi MP 2400 Connects, the company also wants to satisfy the growing quality expectations of its customers. "Because there is a constant upward trend, and we definitely want to respond to this as well," says Keine.

"…and then Mitsubishi simply won us over with their consulting expertise and price quotation. We opted in the end for two identical machines in the upper segment.

Frank Keine,
Managing Director at Winfried Keine

Winfried Keine Metallverarbeitungsges. Mbh

Founding year
1973

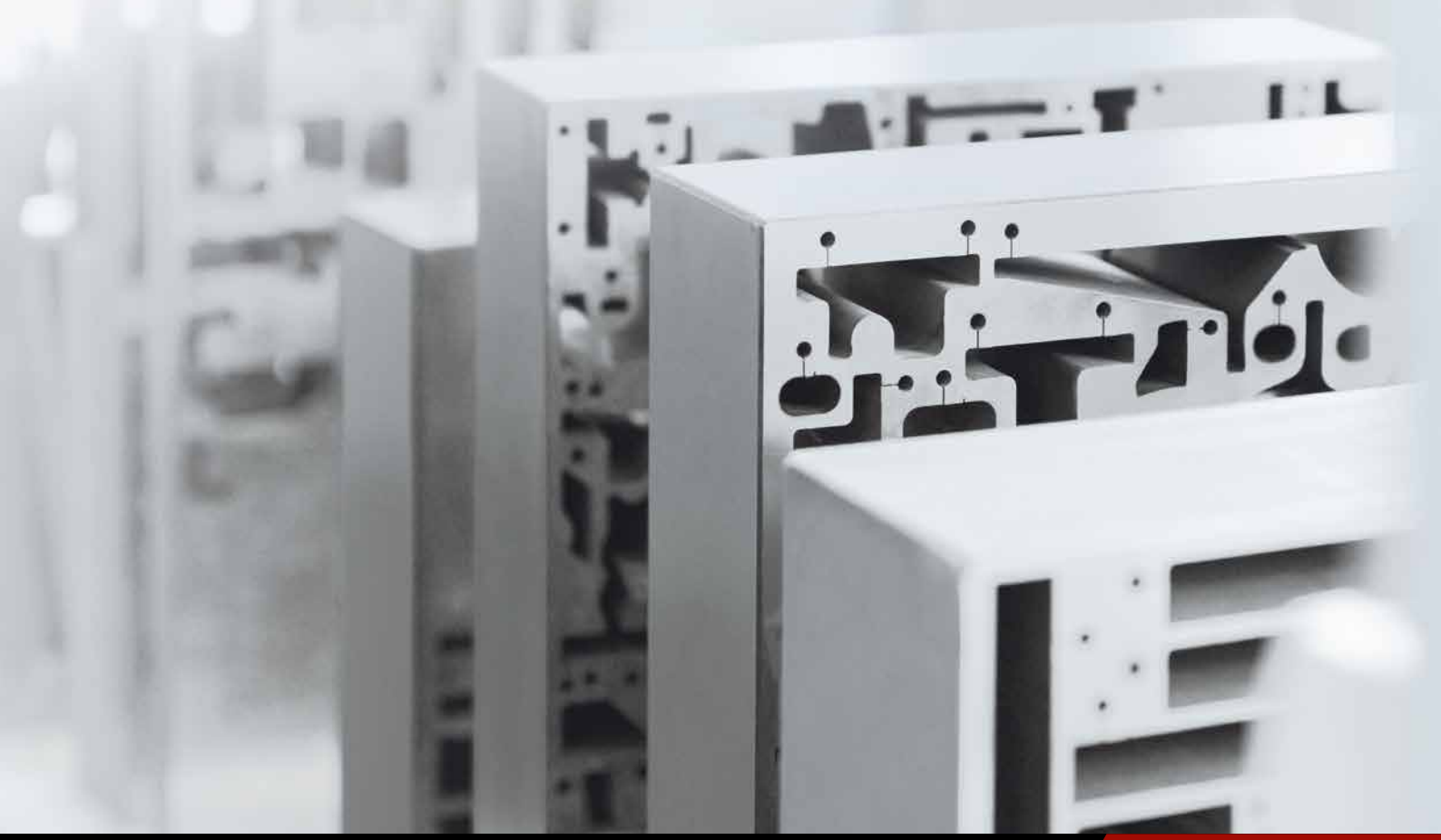
Managing Director
Frank Keine

Core business
Production of stamped and bent parts

Contact
Zum Elberskamp 9
57413 Finnentrop-Heggen
Germany

Tel +49 2721 9549 5
Fax +49 2721 9549 99

www.keine.de
info@keine.de



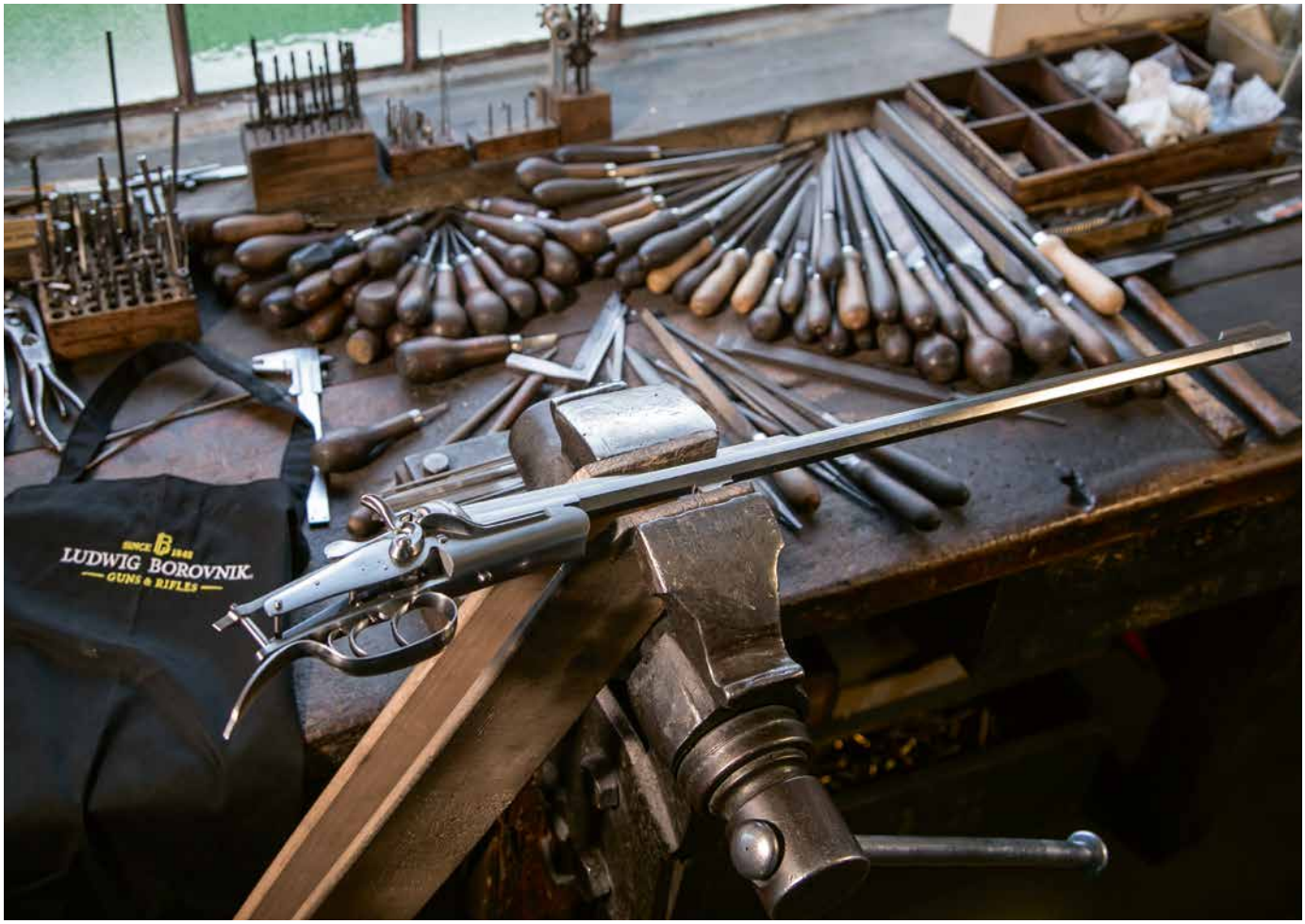
Instinct for materials function and design.

Ludwig Borovnik KG Guns & Rifles

EDM for UNESCO World Cultural Heritage.

What Ludwig IV and V get out of their eroding machine.

In the production of technically and visually sophisticated hunting weapons, gunsmiths rely on their instinct for materials, function and design as well as their craftsmanship. But they have to hold their own in the face of international competition. That is why Ludwig Borovnik, a successful gunsmith in Ferlach, Austria, now in its sixth generation, has invested in a die-sinking and a wire EDM machine from Mitsubishi Electric.



Tradition-steeped craftsmanship

Ludwig Borovnik Guns & Rifles in Ferlach is well-known and recognised worldwide as a manufacturer of high-quality hunting rifles. Hunters and collectors appreciate them for their high reliability, outstanding accuracy and exceptional aesthetic finish. Finely engraved with artistic motifs, the lock cases harmonise perfectly with sophisticated breech, trigger and safety systems. Durable, ergonomically adaptable stocks made of selected precious and root woods contribute to perfect precision and complement the high-end look of the hunting rifles to best effect. Ludwig Borovnik also realises unusual combinations of calibres, trigger and safety mechanisms (locks). There are double-barrel rifles and shotguns as well as triple-barrel rifles with barrels arranged either one above the other or side-by-side in different combinations for a variety of bullet and shot calibres. Versions with an external trigger satisfy the nostalgic wishes of lovers of robust rifles. These hunting rifles have stood the test of time worldwide as reliable, universal implements in the hunt for big, cloven-hoofed, small and feathered game.

Precision craftsmanship as a quality feature

Ludwig Borovnik in Ferlach tells us that most armourers and gunsmiths craft their weapons by hand. He himself is an engineer and learned the craft of gunsmith. He belongs to the fifth generation to work in the company. ”It takes about two years to make a high-quality hunting rifle. Our skilled gunsmiths, shafters and engravers work hand in glove. The outcome is not only weapons of the highest technical and functional precision and quality, but also true works of art in terms of appearance,” Borovnik explains. These are highly appreciated by hunters and connoisseurs all over the world, he continues. However, the elaborate manual production process also has its price. Borovnik has become increasingly aware that even the most affluent enthusiasts will compare prices internationally, so he is keen to find ways to maintain his successful position in the global

Durable, ergonomic and high-grade.

It takes about two years to make a high-quality hunting rifle. Our skilled gunsmiths, shafters and engravers work hand in glove. The outcome is not only weapons of the highest technical and functional precision and quality, but also true works of art in terms of appearance.

Ludwig Borovnik,
sixth-generation gunsmith at Ludwig Borovnik KG

Ludwig Borovnik KG

History

1848 Foundation

Today's Ludwig Borovnik Guns & Rifles in Ferlach goes back to the gunsmith Ludwig Borovnik I. He founded a gunsmith's back in 1848. After starting with rifles for the military, he soon specialised in producing accurate and reliable hunting weapons.

1900

By 1900, more than 50 gunsmiths were working at the workshop in Ferlach. Ludwig Borovnik II now ran the business. Each year, four product catalogues were issued in two languages, presenting a comprehensive range of weapons, ammunition and hunting accessories.

1930–1950

After extremely difficult circumstances in the 1930s, expulsion in the 1940s and the return to his native country after 1945, Ludwig Borovnik III founded a new company in Ferlach in 1950 and established a business for woods for rifle stocks, and especially walnut wood, that was successful beyond the region.

1960 Re-foundation

Friendships with hunting enthusiasts from 1960 onwards led to the re-foundation of the Ludwig Borovnik gunsmith's business. In 1986, Ludwig Borovnik IV took over the management of the company.

2010 Award UNESCO World Cultural Heritage

Ludwig Borovnik IV still manages the company in Ferlach today, which was awarded World Heritage status in 2010 for its quality products. In the shape of Ludwig Borovnik junior, the sixth generation is all set to continue the worthy tradition of gunsmiths in Ferlach.

Machining times accelerated.

On the left Ludwig Borovnik jun. (Ludwig Borovnik V); on the right workshop manager Marin Micic

marketplace. He has been quick to appreciate the benefits of the partially industrial production of certain components. "This applies above all to the prefabrication of the mechanical elements, i.e. the lock case and the many individual parts of the trigger and safety. Here we hope to shorten machining times. By pre-machining items on state-of-the-art industrial tools, we aim to significantly accelerate machining while upholding the utmost precision," Borovnik explains.

Highest distinction: Even UNESCO appreciates the special achievements of the Perlach gunsmiths and is honouring them as World Cultural Heritage.

Catalogue cover from the year 1900

EDM thoroughly cost-effective

After carefully comparing several manufacturing processes and machines, the gunsmiths in Ferlach decided to invest in EDM technology. They found suitable machines at Mitsubishi Electric. The gunsmiths now use an EA12S die-sinking EDM machine and an MV1200S NewGen wire EDM machine. "Mitsubishi Electric won us over right from the start with their demos. The machines are easy to operate and have an excellent price-performance ratio for us. In addition, our workshop manager Marin Micic already had experience with such machines," Borovnik reports. On the MV1200S NewGen wire-cutting machine, the gunsmiths mainly machine the blanks for the breech and the lock case. These are joined by a number

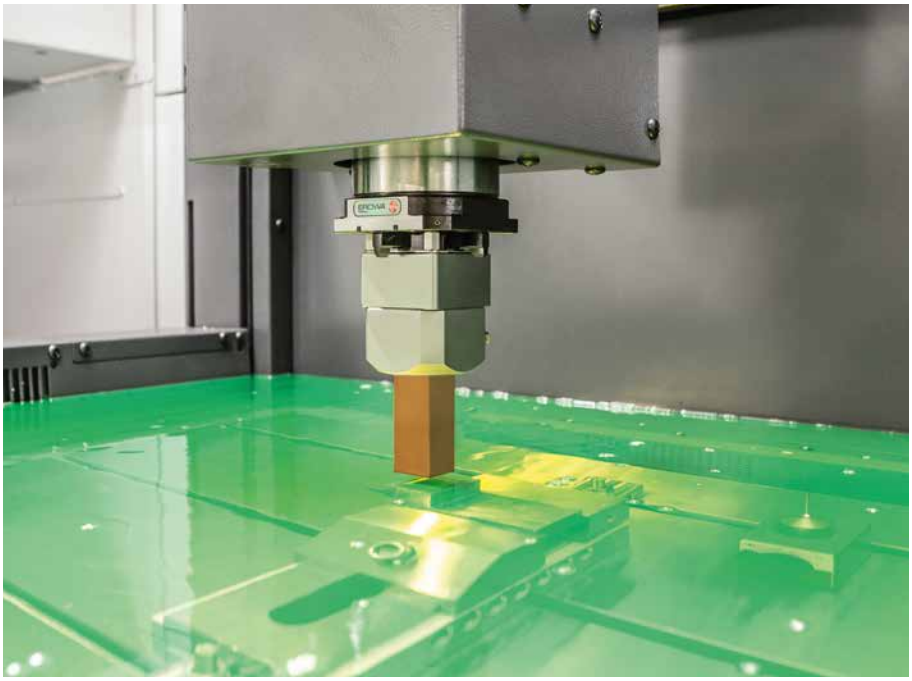
Mitsubishi Electric won us over right from the start with their demos. The machines are easy to operate and have an excellent price-performance ratio for us.

Ludwig Borovnik,
sixth-generation gunsmith at Ludwig Borovnik KG

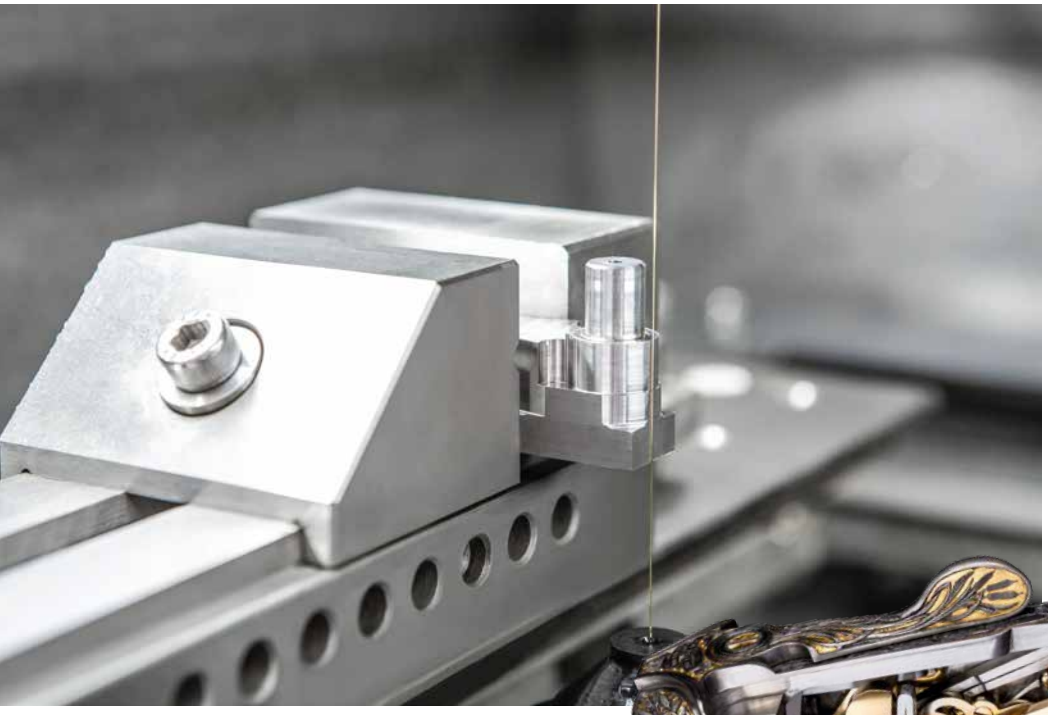
of components for the complex trigger and safety systems. This is done to an accuracy of about 0.01 mm, says Borovnik. However, the accuracy only plays a subordinate role, since it is important to machine all geometries at precise angles to each other. Then the pre-machining considerably shortens the time from the blank to the finished component, which is manually fitted and adjusted by the gunsmiths to the highest precision and accuracy of fit.

Superior to milling

For gunsmiths in particular, Borovnik sees an outstanding advantage over other machining methods, such as milling: ”We machine extreme high-quality and therefore costly grades of steel, which are melted down in small batches especially for gunsmiths. That’s why we have to make sure that we make the best-possible use of the blanks. Wire-cut EDM produces only narrow kerfs. There’s no swarf, so there’s no waste.” The gunsmiths also machine some geometries for different parts of the breech, trigger and safety mechanism using die-sinking EDM on the EA12S. For this, the electrodes of copper are



Geometries with precise angles.



The blanks for the breech and the lock case are machined on the MV1200S NewGen wire-cutting machine.

produced on the MV1200S NewGen, Borovnik continues. He sees the combination of the two machines as the optimal solution for his company.

Programming and operation quickly mastered

For specialist craftspersons like gunsmiths, high-tech methods often take some getting used to. But not so at Borovnik in Ferlach. "We were given several days of training by Mitsubishi Electric. The programming and operation of the EDM systems from Mitsubishi Electric is very easy and rapidly grasped thanks to the current technology similar to the smartphone user interface. Our workshop manager Marin Micic also had previous experience of CNC machines. So, within a few days, we were able to machine components productively and efficiently with the MV1200S NewGen and EA12S," says Borovnik. After a few weeks, he and his workshop manager had passed on their expertise of the EDM machines acquired during training to other skilled hands in the company. Programming is usually done directly on the wire EDM. The components are designed as 2D drawings (DXF data) on the CNC control, given the necessary parameters and then machined. "We were all surprised at first how easy it actually is," says Borovnik summing up his experience with the high-tech EDM equipment.

Ludwig Borovnik KG Guns & Rifles

Founding year
1848

Managing director
Ludwig Borovnik V

Employees
10

Core business
Manufacture of exclusive, high-quality hunting weapons

Contact
Bahnhofstrasse 7
9170 Ferlach
Austria

Tel +43 (0) 699 188 00 983
Fax +43 (0) 4227 43 49

www.ludwigborovnik.at
office@ludwigborovnik.com

Sales partner for Mitsubishi Electric EDM systems in Austria
Büll & Strunz Ges.m.b.H.

www.buellstrunz.at
vertrieb@buellstrunz.at

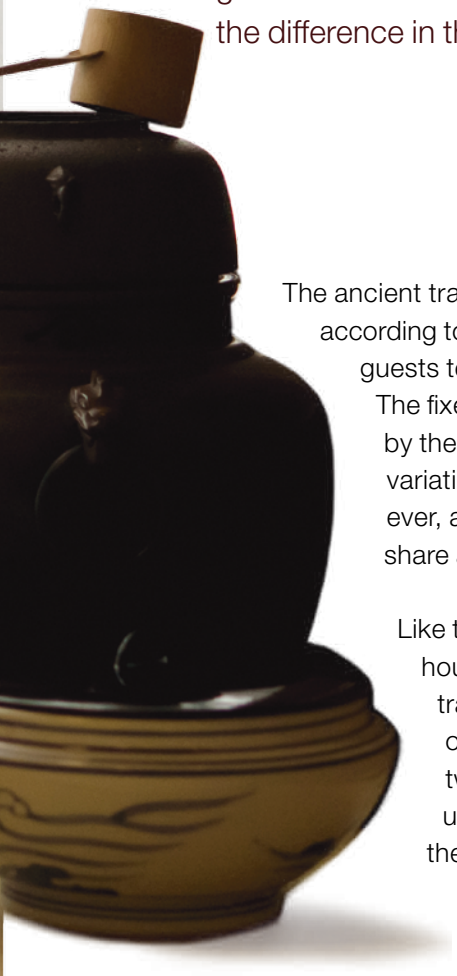
The Japanese tea ceremony is very closely allied to the philosophy of Zen on which it is based. The concentration of the mind and deep contemplation are just as important as meticulous procedure and extreme thoroughness.

Thoroughness with a long tradition.

Tea is a work of art

that needs the hands of a master.

Absolute accuracy and the greatest possible care are of special importance in the Japanese tea ceremony. In this ancient tradition, tea is prepared, served and drunk with great attention to detail. The strictly defined procedure and extreme precision make all the difference in this special ceremony.



The ancient tradition follows certain rules according to which the host serves his guests tea, rice wine and light meals. The fixed rules are followed strictly by the host, but there can be slight variations to the procedure. However, all Japanese tea ceremonies share a certain basic form.

Like the ceremony itself, tea houses in Japan have a long tradition. Mostly made of wood or bamboo and divided into two rooms, the main room is used as a tea room, where there is a fireplace and an iron kettle. The preparation room is also very sparsely furnished. Furniture and decorative items are not to be found in a Japanese tea house, since the participants in a tea ceremony should be exposed to an atmosphere of restraint. Reflection on the authentic and humility play an essential role in this tradition of exactitude and refinement.

The Japanese tea house is usually surrounded by a Japanese garden, through which a small path winds. This path leads never directly to the entrance of the tea house, but with numerous detours. Traditionally the tea house is about 3 metres by 3 metres in size. The participant of the tea ceremony is symbolically screened off from the outside world by plain outer walls and windows covered with paper.

The Japanese tea ceremony is based on purity, harmony, respect and tranquillity. Absolute purity is made possible by the scrupulously observed procedure. The term purity also denotes inner purity of mind as well as outward cleanliness and tidiness.

The procedure of the Japanese tea ceremony
The ceremony starts in the garden of the tea house where a handful of guests gather to participate in the tea ceremony. With a bow and a basin of hot water, the host greets his guests waiting for him in a pavilion. At a spring the host washes his hands and mouth and requests his guests to do the same. Symbolically, the participants use this water to cleanse themselves of all evil that they have previously said or done.

To reach the tea house, the participants follow a small path through the garden, which symbolises a form of enlightenment. Its purpose is to help the participants to detach themselves from everyday life and to prepare them for the following ceremony. Arriving at the tea house, the guests enter the interior one after the other respectfully and humbly, thereby divesting themselves of all social differences. Soups, rice wine and other light meals are served to the guests in several courses. The participants then return along the garden path to the waiting pavilion to smoke and converse.

The actual main part of the Japanese tea ceremony begins with five gong beats with which the host invites his guests into the room intended for the ritual. The guests cleanse themselves again and proceed along the path to the tea house and then enter the tea room silently, quietly and with great respect. Usually the entrance to the tea room is only about half a metre high, so guests can only enter this room on their hands and knees, as a gesture of humility. As soon as all participants have entered, the last guest closes the door softly yet audibly. This sound is the sign for the host to continue with utmost precision and to begin the ritual proper. The master then enters the room last and brings in the still missing utensils. The most important items for the tea ceremony are the tea bowl, tea caddy, iron kettle, a vessel for fresh water, the scoop and tea whisk. On his ”obi” belt the host wears a white tea towel for cleaning the tea bowl.

Purifying ritual.

The host prepares the tea according to a very special rite, using the tea utensils in a specially prescribed manner.

The utensils are practically arranged to permit harmonious movements during tea preparation.

The host bows to his guests and prepares the tea according to a very special rite, using the tea utensils in a specially defined manner. During the preparation of the tea the master precisely observes the prescribed procedures of the ritual. Of overriding importance are smoothly coordinated movements and strict calmness.

Once the tea is ready to serve, the host first hands a bowl of tea to the main guest, who takes a bow in accepting it. With a gesture, the main guest offers the cup to the person sitting next to him, who refuses and asks the main guest to drink first. The guest apologises for the others having to wait. The guest turns the tea bowl twice in his hand and drinks the tea in about three sips. Then the participant hands the bowl back to the master, who cleans it with his cloth, refills it with tea and hands it to the next guest. The tea is served to everyone present in this way. The scrupulously observed procedures of the ceremony, such as the introduction, cleaning and refilling of the bowl, communicate a sense of respect and tranquillity to the guests.

During the ritual, speaking is usually strictly prohibited. Only after the ceremony is the silence broken to ask about the types of tea used. After this brief exchange, in which usually no topics from outside the tea room are discussed, the tea ceremony comes to an end.

The principles of the Japanese tea ceremony

The Japanese tea ceremony is based on purity, harmony, respect and tranquillity. Absolute purity is made possible by the scrupulously observed procedure. The term purity also denotes inner purity of mind as well as outward cleanliness and tidiness. The minimalist approach in the design of the tea house and the meticulous sequence of actions during the tea ceremony underscore a spirit of purity.

Harmony also arises though strict adherence to the rules of the tradition. The exact chronology of the tea ceremony and its precise execution establish an atmosphere of harmony between the participants. In this way the complex procedure can be carried out with extreme precision, which in turn instils respect among the participants, as well as a certain reverence for the objects used. If the three aforementioned principles of purity, harmony and respect are achieved through the precise observance of the tea ceremony, the participants can achieve inner peace and a sense of equanimity.

Furniture and decorative items are not to be found in a Japanese tea house, since the participants in a tea ceremony should be exposed to an atmosphere of restraint.

Hemmann Schleiftechnik GmbH

When every micrometre counts.

Tool steel, carbide, ceramics, polycrystalline diamond…

Switzerland has always enjoyed an excellent reputation when it comes to care and accuracy in precision manufacture. This applies not only to watches, but also to intricate mechanical items, tools / machine tools and medical technology. Family-run Hemmann Schleiftechnik GmbH in Bettlach, a manufacturer of tools and mechanical components made of extra-hard and therefore difficult-to-machine materials, is also frequently given ”± 1 µm” as a tolerance specification.

Target tolerance ± 1 micrometre.


K460

”We produce high-precision tools and special parts for industrial customers in high-tech industries such as toolmaking, medical technology, precision mechanics and the watchmaking industry,” says Rolf Hemmann, Manager of Hemmann Schleiftechnik GmbH in Bettlach (Switzerland). They machine hard and super-hard materials such as high-strength steels, tungsten carbides, ceramics and even polycrystalline diamond. Composite materials are also often involved, such as carbide bodies with a sintered layer of polycrystalline diamond (PCD). Most of these materials cannot be machined with conventional techniques such as turning, milling and drilling, so they resort to special processes such as grinding and spark erosion. The main focus here is on meeting the highest standards of precision, which often go down to the 1-µm range. Concentrating on one-off products and small series, the medium-sized company founded by Rolf Hemmann in 2002 has an outstanding reputation in this field and supplies customers throughout Europe, the USA and Asia. Two years ago, they took over Brotec AG, another company with a similar focus, but one that concentrates more on series production.

Development in partnership with the customer

”Since we’ve got a lot of experience of the processes we use, we can often give our customers tips on how best to produce the parts they need,” adds Michael Hemmann, who is the second-generation head of the company. Looking at the design drawings of customer parts, he sometimes realises they are difficult to machine the way they have been designed by the developer. When wire-cutting, for example, ”bridges” have to be left between the residual material and the machined component to prevent the component from slumping in an uncontrolled way after the last connection has been cut, thus causing damage to the component’s edges. The removal of these residual bridges after manual extraction can also necessitate additional machining effort. The dimensions and positioning of these residual bridges as well as – especially in series production – the best-possible arrangement of the parts on the blank can have a considerable impact on the efficiency of production. In unfavourable circumstances, unsuitable specifications with regard to tolerances or surface qualities, for example, can also have a negative effect on effort and costs. That is why the company is happy to provide customers with the necessary advice. In some cases, significant benefits can be achieved in terms of costs and quality – a service much appreciated by customers.

A precision stamping tool for the production of tiny gearwheels for a customer in the watchmaking industry

Plenty of experience for efficient production.

The disc is made of carbide with a thick layer of sintered-on diamond. Wire EDM is used for cutting the small high-precision blanks for PCD drills and milling cutters.

EDM since 2003

”Many of our jobs can be accomplished better by electric discharge machining than by grinding,” says Rolf Hemmann. That’s why he introduced wire EDM back 2003. He now has six EDM systems, four of which are wire EDM systems, one die-sinking EDM machine and one start hole drilling machine. Originally using equipment from a competitor, he gained his first experience of Mitsubishi Electric during the procurement of a die-sinking EDM system, culminating in the decision in favour of an EA12V in 2007. This is mostly used for tasks such as the countersinking of entry cones in nozzle tips. He was so impressed by it that he opted for Mitsubishi Electric systems for his wire EDM machines the following year and in 2020. The first of these, a Mitsubishi Electric MP1200 Connect, uses deionised water as the dielectric, while the MX600 uses oil.

Benefits of the Mitsubishi Electric systems

”We purchased our first Mitsubishi system after carrying out trials with both makes,” Michael Hemmann reveals. It turned out that the Mitsubishi Electric technology met the requirements better. The results obtained later in the workshop endorsed their decision. An important factor is the superior automatic wire threader of the Mitsubishi

The Mitsubishi Electric MP1200 Connect wire-cut EDM system uses deionised water as the dielectric.

The Mitsubishi Electric EA12V Advance die-sinking system is used for jobs such as the countersinking of entry cones in nozzle tips.

Round-ground carbide tool blanks with a sintered PCD diamond layer after being cut out of a round blank by wire erosion.

Electric systems, which is important for trouble-free running during unmanned operation outside working hours. The Mitsubishi Electric software is also much more stable, i.e. unlike on the rival machine, it is less prone to crash. Also impressive are the Tubular Direct Drives of the movement axes, which permit higher precision coupled with less wear. In addition, the Mitsubishi Electric systems do not require coated cutting wire to achieve the same accuracies as rival systems with coated wire. This makes an appreciable difference in costs. Nor have there been any failures so far with either of the Mitsubishi Electric wire systems.

Also worth mentioning are the differences in the software. The Mitsubishi Electric software is more versatile and permits the setting of many parameters. Although this makes getting started a little more difficult, once this learning phase is accomplished, you have more tricks at your fingertips to help master extra-demanding jobs.

Good support

”We’re also very happy with the support we’ve received from Mitsubishi,” says Rolf Hemmann. At the German branch, he says, there are highly skilled staff who not only know the machines well, but also the challenges that arise in practice, and who can help quickly and efficiently when problems arise. Should he encounter problems with specific applications, he can call them and obtain help quickly and efficiently. Of course, this is also very helpful during training courses. In the case of the only real problem so far, which occurred on the die-sinking EDM machine, the matter was resolved over the phone without the need to have a technician sent out.

High accuracy coupled with lower wear.

Founded in 2002, the family business Hemmann Schleiftechnik GmbH is run jointly by father Rolf Hemmann (left) and his son Michael.

Hemmann Schleiftechnik GmbH

Founding year
2002

Managers
Rolf Hemmann, Michael Hemmann

Employees
25

Core business
Grinding and eroding

Contact
Bielstrasse 33
2544 Bettlach
Switzerland

Tel +41-32-34174-39
Fax +41-32-34174-59

Info@hemmann-schleiftechnik.ch
www. hemmann-schleiftechnik.ch

Mitsubishi Electric partner for EDM systems in Switzerland
Josef Binkert AG
Grabenstrasse 1
CH-8304 Wallisellen, Switzerland

Tel +41 44 832 55 55
Fax +41 44 832 55 66

info@binkertag.ch
www.binkertag.ch

MITSUBISHI ELECTRIC

100 YEARS OF COMPANY HISTORY

The founder Yataro Iwasaki (1835–1885)

FOUNDING

Mitsubishi Electric's first important commercial product was an electric fan that soon became a nationwide bestseller.

1921

WHAT ALSO HAPPENED IN 1921

The English magician P. T. Selbit is the first to perform the illusion of sawing a woman in half in London.

Albert Einstein receives the Nobel Prize for Physics.

Germany's first car race track, the Automobil-, Verkehrs- und Übungsstrasse (AVUS), opens in Berlin.

BIGGEST ENGINE WITH 9,000 HP

Commemoration of the completion of Japan's (then) largest engine with an output of 9000 hp.

1930er

The first lift in Mitsubishi Kobe Hospital was installed.

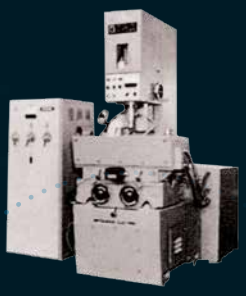
Start of business with lifts and escalators.

1935

MITSUBISHI ELECTRIC
100 YEARS OF INNOVATION
Anniversary

Mitsubishi Electric's first television set (model 101K-17) was launched in 1953.

Mitsubishi Electric begins research into and development of EDM technology.



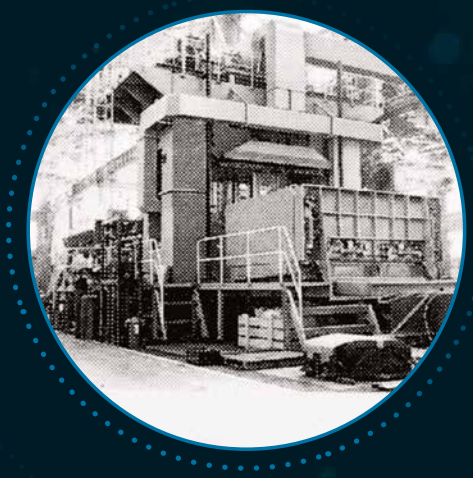
FIRST DIE-SINKING MACHINE

Exports of the first generation of EDM machines, the DM 201, begin two years later.

Germany wins the football World Cup for the first time.

1953
First ascent of Mount Everest

Neil Armstrong becomes the first human to set foot on the moon.



GIGANTIC

In 1970, Mitsubishi Electric launches a truly gigantic EDM machine.

1952 1953 1954 1964 1969 1970

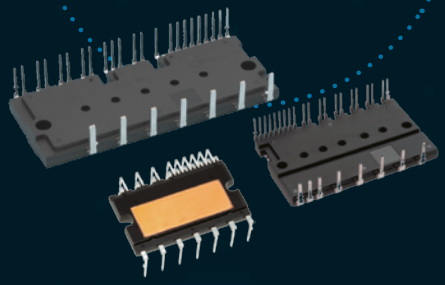
100

THE NO. 1

Since 1997

800,000,000

DIPIPM™ transfer-molded package intelligent power modules were produced.



The

10,000th

EDM system rolls off the production line.

1972 The first wire EDM systems go into mass production.

WORLD'S ONLY COMPANY

1985 to produce spiral escalators – the first spiral escalator was supplied in 1985.

1991 Mitsubishi Electric establishes its own sales, marketing and service organisation in Ratingen, Germany.

NICE FOR RICE

1984 Mitsubishi Electric launches the first rice cooker/heater.

1984 The first e-mail reaches Germany.

1990 Commercial launch of the world's first car navigation system using GPS

MITSUBISHI ELECTRIC
100 YEARS OF INNOVATION
Anniversary

WORLD'S TALLEST TEST TOWER FOR LIFTS

173 m tall – went into operation in 2007

TIMES SQUARE NEW YORK

World's largest Ultra HD video screen installed in New York's Times Square: 2014 – 23.8 million pixels, 4064 screen diagonal

144 PICS PER DAY

Launched in 2014, the Himawari-8 weather satellite scans the entire Earth every 10 minutes and takes 144 pictures every day. In this way, it contributes to the study of meteorological phenomena and the atmosphere.

FIRST SATELLITE

Blast-off for SUPERBIRD C2, the first commercial satellite built in Japan

Mitsubishi Electric opens its new German headquarters in Ratingen.

800,000 LIFTS

supplied by Shanghai Mitsubishi Elevator by 2018

Researchers report the first successful direct measurement of gravitational waves.

2007 2008 2014 2015 2016 2020

100 Years Special

100

26,000,000 FREQUENCY INVERTERS SOLD WORLDWIDE

26,400 WORKPIECES WIRE-CUT PER SEASON IN TOP-LEVEL MOTOR RACING

This is how many workpieces are produced each year at Alfa Romeo Racing on Mitsubishi Electric EDM systems.

WORLD MARKET LEADER

World market leader in the field of electrical discharge machining, having produced 70,000 systems for high-precision machining

146,518 EMPLOYEES WORLDWIDE

from more than 29 nations

2021

MITSUBISHI ELECTRIC
100 YEARS OF INNOVATION
Anniversary

GALACTIC

Mitsubishi Electric has sent 40 satellites into orbit.

ANNUAL SALES 35.4 BILLION EUROS

WORLD'S FASTEST LIFT SHANGHAI TOWER 73.8 KM/H

Mitsubishi Electric delivers the world's fastest lift.

IN GLOBAL USE

OVER
17,000,000
compact controls
in global use

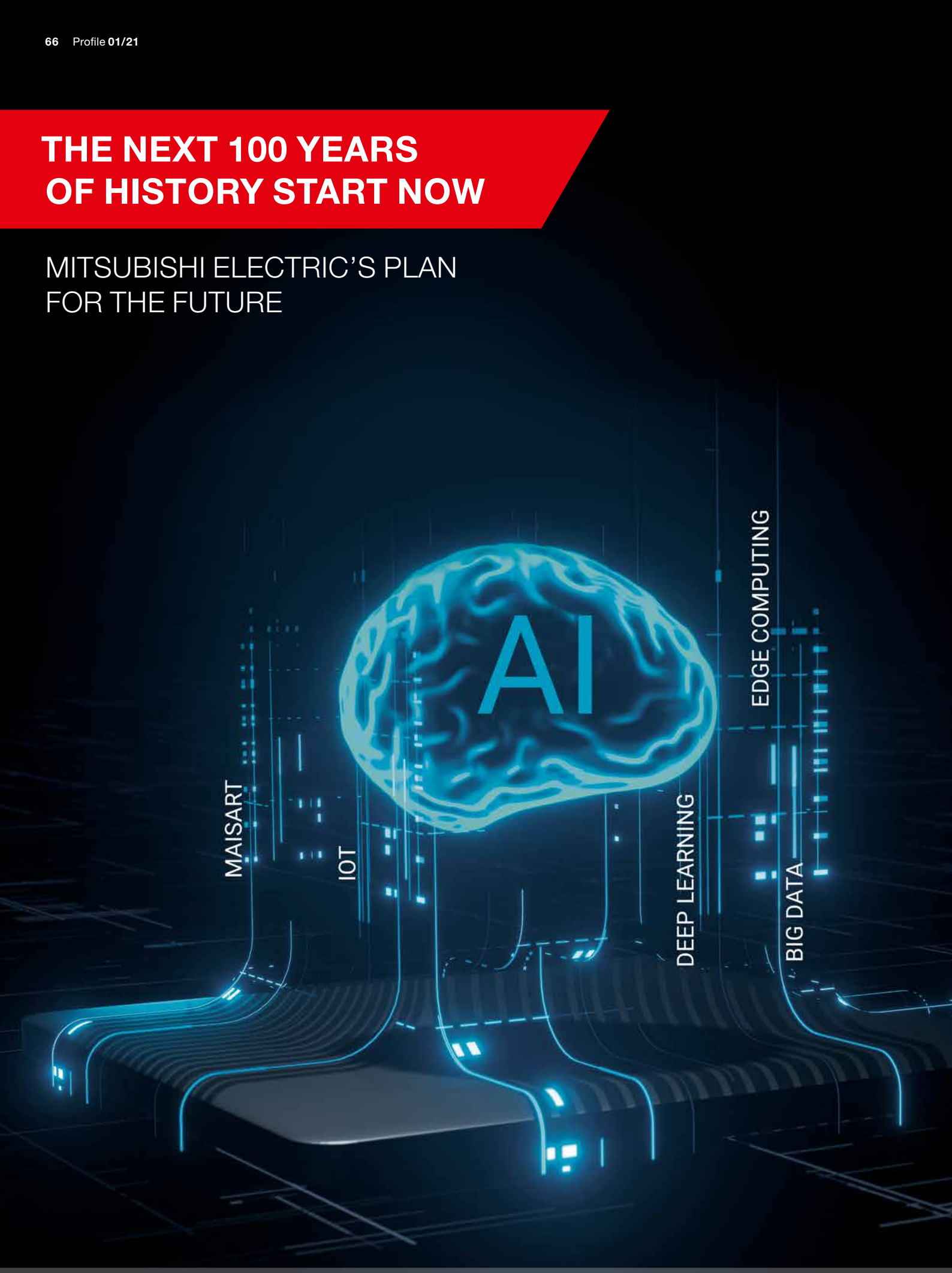
203 LOCATIONS WORLDWIDE

2ND MOST INNOVATIVE COMPANY WORLDWIDE

Mitsubishi Electric files the second-most international patent applications and is first among Japanese companies.

THE NEXT 100 YEARS OF HISTORY START NOW

MITSUBISHI ELECTRIC'S PLAN FOR THE FUTURE



MITSUBISHI ELECTRIC
100 YEARS OF INNOVATION
Anniversary

MAKING LIFE MORE COMFORTABLE WITH MAISART

We call our full AI learning and analytics suite 'Maisart' (Mitsubishi Electric's AI creates the State-of-the-Art in technology). On top of highly efficient big-data analysis, Maisart encompasses compact deep-learning algorithms and reinforcement learning techniques. These enable cutting-edge innovations like cognitive satellite systems, driver assistance for autonomous cars, smart fault-detection solutions for trains, and self-adjusting control systems for buildings.

We're even using co-operative AI to help automated vehicles learn and imitate the actions of skilled factory workers – enabling safer and more efficient collaboration between people and machines in the workplace. Our goal is to help nurture a more productive, more comfortable society. Through Maisart, we're making it possible.

Machine-learning with an edge

Our innovative edge computing technology helps to make daily life more comfortable and businesses more efficient. It's all part of Maisart, our AI suite that allows big-data analytics. The power of the cloud has transformed the world of business, as well as our everyday lives. Yet as the Internet of Things (IoT) grows exponentially, linking more devices that generate ever more data, conventional cloud data-centres can struggle in two ways. The first relates to speed. Data takes time to travel from device to data-centre and back. This delay is called latency, and lower latency – less delay – means a better user experience.

A second challenge is that today's massive demand on data-centres means it takes a lot of money to run and store all the data – and that's before any filtering or initial analysis can take place. To solve these problems and future-proof networks, Mitsubishi Electric uses edge computing.

Giving users and businesses the edge

Whatever we're doing online – analysing market data, checking the weather or scanning travel updates – we all expect instant, up-to-date information. With edge computing, the data from time-sensitive interactions like these can be processed closer to the source. This offers a faster and smoother user experience. For IT managers, the distribution of processing loads also means more flexible and scalable networks.

Even more powerful commercial benefits become available when we combine edge computing with Mitsubishi Electric's artificial intelligence (AI) technology to make manufacturing sites smarter. For example, our AI-infused systems can rapidly analyse big data at the edge, collecting it from sensors on factory machinery or underground pipelines. They machine-learn typical time-series patterns and then quickly work out degrees of deviation. This enables businesses to spot maintenance issues and fix problems before they even arise.

LANGUAGE WITHOUT BARRIERS?

Enabling new conversations, across the world
Whether you need to communicate with a foreign-language speaker or a person with hearing impairments, Swipe to Talk User Interface technology makes it simple.

Booking a hotel room in a foreign city. Meeting international colleagues without a common language. Chatting with someone who has a hearing impairment.

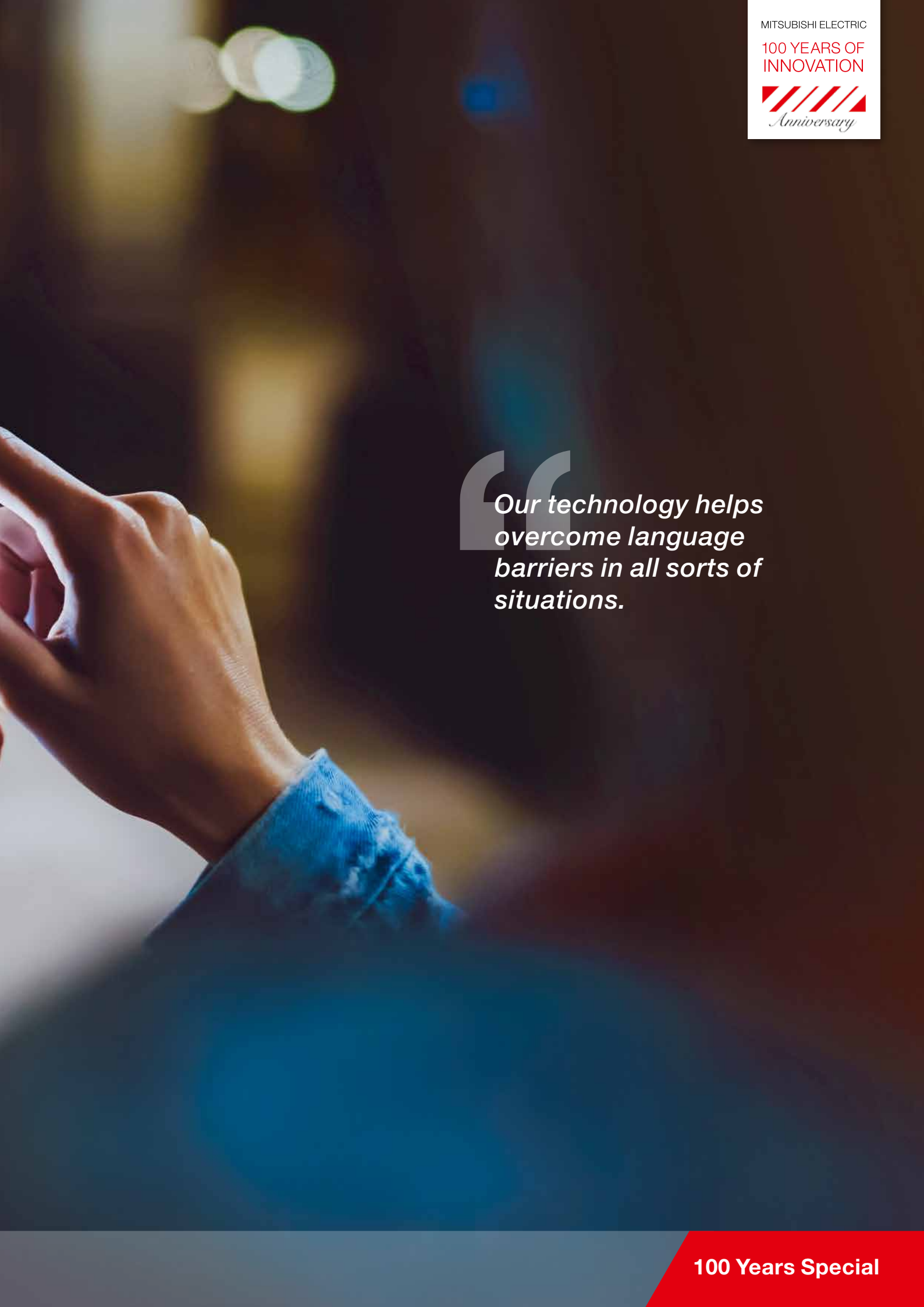
Wouldn't a magical translation device make life easier? A tool that could instantly bridge the communication gap – aiding richer understanding, supporting inclusion and bringing people closer together.

Translation made richer
When a user speaks into the microphone and swipes their finger across the screen, their spoken words 'flow out' as text. It's as though the body is speaking through the fingertip.

This more personal interaction lets users add drawings to their message. They can also split the screen to present two mirrored pages, making conversation even easier.

For example, imagine a Japanese tourist in Germany asking directions via the Swipe to Talk User Interface technology.

She speaks-and-swipes in Japanese. Her German conversation partner looks down and sees a German translation on the split screen – the right way up. To reply, he sketches the route, and speaks-and-swipes in German. She sees his map and words in Japanese. Simple.


MITSUBISHI ELECTRIC
100 YEARS OF
INNOVATION
Anniversary
Our technology helps overcome language barriers in all sorts of situations.
100 Years Special

WORKING TOGETHER WITH ROBOTS

Bringing an automated future within reach
Our cutting-edge industrial robot can 'learn' precise movements simply by being guided through them, and will safely work alongside humans on complex manufacturing tasks. Machine-to-machine communication. The Internet of Things. Smart machines that 'learn' without human intervention. Some call it Industry 4.0 or the fourth industrial revolution; we call our concept e-F@ctory. And as digital innovation transforms society and business with it, today's companies are increasingly looking for versatile, creative and, above all, user-friendly solutions.

Introducing a new kind of robot

Our new series of robots, MELFA ASSISTA, will help companies respond flexibly to today's rapidly changing business environment.

As a collaborative robot, or 'cobot', ASSISTA is designed to work safely alongside humans. And when deployed in industrial settings such as manufacturing sites, it will even help companies meet new social distancing requirements at work. For easy system deployment, we've created intuitive engineering software called RT VisualBox. This enables operators to set up ASSISTA quickly and inexpensively, compared to standard industrial robots.

ASSISTA is efficient, highly precise and robust. So companies that use robotic manufacturing systems can combine it with RT VisualBox to boost productivity while reducing their total cost of ownership.

Keeping you safe and in control

We've made MELFA ASSISTA so easy, helpful and safe to use that we believe it will change people's view of robots.

With a smart 'train by demonstration' interface, you can easily teach it what to do. Just press a 'Save' button on its arm and guide it through the required movements. You can also programme it via a PC or tablet.

ASSISTA prioritises the safety and wellbeing of people, strictly complying with relevant international safety and robot standards. The LED light on the robot's arm clearly shows if it's at work. And it automatically scans its environment to ensure there's no chance of coming into contact with anyone.

To flexibly help out in various scenarios, ASSISTA offers a wide range of custom-made peripherals, including grippers and vision. It can even be configured to move freely and safely as a mobile robot.

Thanks to advanced safety technologies, humans can share a workspace with our robots.

MAKING AUTONOMOUS DRIVING SAFER

Driving positive change with xAUTO (Autonomous Driving System)

Not so long ago, the idea of a car without a driver sounded like science-fiction fantasy. No more. Our expert engineers, programmers and designers are pioneering systems that help make it a reality.

Creating systems that make driving safer is a natural goal for Mitsubishi Electric. Our expertise is even helping to make self-driving vehicles possible. This promises benefits for everyone – society and individuals alike – including fewer accidents, stress-free motoring and more productive commuting.

But how do you equip a vehicle to safely navigate complex road systems at speed? What sort of new driver-assistance technologies will be needed? And how will they deal with exceptional driving conditions like snow?

Keeping you safe and in control

When you go for a drive around town, your senses, judgment and body work together. You scan what's around you, make countless small but critical decisions, and physically operate your vehicle – often subconsciously.

Our vision is to replicate these human activities with technology. And that's where xAUTO, our new Autonomous Driving System, comes in.

xAUTO brings together our advanced sensing, vehicle control and telecoms systems. For example, we can integrate a forward-looking camera and millimetre-wave radar sensor to measure the distance and relative speed of other vehicles, bicycles, pedestrians and objects.

Our system can differentiate lanes, detect nearby pedestrians and vehicles, read signs and even auto-adjust your headlights for oncoming cars.

All data is fed to an in-car computer called an electronic control unit (ECU), which uses algorithms to determine the safest, most comfortable next action.

Safety is our priority. So, using an on-board camera, the driver can be monitored for signs of drowsiness, ill-health or distraction, ensuring they're ready to take over from autonomous to manual driving mode.

This system can also be integrated with our infotainment system and used to monitor all passengers in the vehicle, including infants.

MITSUBISHI ELECTRIC

100 YEARS OF INNOVATION

Anniversary

100 Years Special

OUR VISION FOR A BETTER, SAFER FUTURE

We've long worked towards a low-carbon, circular economy. But with our new Environmental Sustainability Vision, we've supercharged our plans to secure a brighter future.

Our responsibilities are at the heart of our corporate vision. That's why, as we work to create a better world, we're prioritising ethical practice, compliance and environmental protection. Our Environmental Vision 2021 committed us to a wide range of sustainability initiatives. Now, as April 2021 approaches, we're introducing our Environmental Sustainability Vision 2050 – which places an even higher priority on action.

Our Three Environmental Action Guidelines

1. Apply diverse technologies in wide-ranging business areas to solve environmental issues
We'll act to combat climate change, improve resource circulation and promote harmonious co-existence with nature.

2. Develop business innovations for future generations
We'll nurture new ways of working that will help improve the quality of life for the generations to come.

3. Publicise and share new values and lifestyles
We'll promote dialogue, collaboration and co-creation, encouraging new values and lifestyles that enable people to live in harmony with nature.

SUSTAINABLE FOR THE FUTURE

Scan the code now
and watch the film:
www.mitsubishi-edm.de/future

MITSUBISHI ELECTRIC
100 YEARS OF INNOVATION
Anniversary

GREEN FACTS

613,000

From its 613,000 metres high orbit, the satellite GOSAT-2 observes global greenhouse gas emissions and contributes to climate research.

99%

Our technology allows different types of plastics to be seperated from products and recovered – with a purity of 99% and higher.

30%

Our SiC Railcar Inverter uses 30% less energy.

36%

Carbon emissions from products in use in the market were reduced by 36 per cent in fiscal 2019.

2,115

2,115 perennials call the natural space of German headquarters their home. It is shared with 16 fruit trees, 6 berry bushes, 6 lavender shrubs and 18 different herbs.

On Mitsubishi Electric's 100th anniversary, Thomas Schreiber has been with the company for 30 years – to the day.

100 years of Mitsubishi Electric – a very special occasion for many employees. Thomas Schreiber, for example, is also celebrating a proud anniversary this year: 30 years as a salesperson for the Japanese company's EDM equipment. In view of his vast experience in the field, the Profil editorial team was able to coax some interesting information out of him from behind the scenes in the specialist areas.

30 years at Mitsubishi Electric – you'll have experienced a lot of things. What was it like when you started?

Thomas Schreiber: I completed an apprenticeship as an electronics technician and then joined the company after applying for a technician position at Mitsubishi Electric. First nine years in service, then two and a half years in technical sales, until I switched entirely to sales in 2001 with the first territories of my own. Spending the earlier nine years on the road in after sales service, where I got to know everything to do with EDM systems – from machine installation and maintenance to user training – was a great help in achieving success in sales.

What are the most important trends in the sector?

Thomas Schreiber: 30 years ago, an EDM system was still a kind of "magic box". Nobody knew how it worked, but everyone realised what this technology was capable of. Today, on the other hand, there is widespread knowledge about EDM products and how it works – you can find EDM in many fields. In addition, the numbers of units, the fields of application and, of course, performance have evolved enormously. So penetration of the market has also brought with it the dissemination of knowledge. One of the biggest differences to the early machines is their neat layout – both technically and visually. Machine building has matured. And design has also kept pace. The machine must also appeal to the eye.

What has been special about your time in service and sales?

Thomas Schreiber: What I really enjoyed was the travelling. I travelled all over Europe and visited countries I had never been to before. Of course, I had to adapt accordingly – which is brilliant for one's empathy and general cultural awareness. This also helps one to understand one's own culture better, and you see it with different eyes – especially in connection with my first trips to Japan. What really sticks out in my mind is the completely different approach to challenges. Instead of proceeding in a more linear fashion, as we do here, the Japanese tend to spiral in on the issue – in ever tighter circles until the problem with all the associated issues has been grasped and thus analysed. Logically, the ideal way would be to combine the different approaches of the two cultures.

What in your view is important for the future of your field?

Thomas Schreiber: No doubt about it: training young people for the field of automation. This is a crucial objective because this area is becoming increasingly important and will be vital for the future. My colleagues and I have therefore put a lot of time, work and, heart and soul into this. The key to a successful future is the ongoing training of our young people. And here I am very optimistic. Because the products are right, the team is right – so what can go wrong? Here's to the next hundred years! *(Laughs)*

Thomas, many thanks for the interview!


MITSUBISHI ELECTRIC
100 YEARS OF
INNOVATION
Anniversary
The key to a successful future is the ongoing training of our young people. And here I am very optimistic. Because the products are right, the team is right – so what can go wrong?
Here's to the next hundred years!
Thomas Schreiber
EDM Regional Manager Mitsubishi Electric
100 Years Special

Horoscope

for hard-wired EDM experts.

Capricorn

22 December – 20 January

Working from home, the daily drudgery has long set in – and the fact that your partner now expects you to wear the FFP2 mask all the time in the comfort of your own home doesn't exactly make things easier. But no need to despair. If you soak your mask in alcohol overnight, the day will be much more fun and relaxed.

Aquarius

21 January – 19 February

Inexpensive, rational, practical and versatile – the Aquarian is just like his or her EDM machine. No wonder that you, as an otherwise pretty down-to-earth person, tend to get emotional about electrical discharge. The automatic wire threader, in particular, lends wings to your precision-mechanical summer feelings. For you, "Intelligent AT" means love at first sight.

Pisces

20 February – 20 March

The stars are looking good! Fortunately, you don't have to abandon your beloved wire-cutting system. Because as an intelligent EDM specialist, you consistently take five cloves of garlic several times a day to protect yourself from COVID-19. This isn't much good against the virus, but all your workmates and other fellow humans will voluntarily keep a distance of three metres.

Aries

20 March – 20 April

Your faithful EDM systems of the MV series can be relied on to keep your business turning over even in these difficult times. Nevertheless, one could become envious if one looks at other sectors. What, for example, are the manufacturers of hand sanitisers doing right now? Well, what do you think? They're rubbing their hands.

Taurus

21 April – 21 May

Like your Tubular Shaft Motor, you're bursting with energy at present. You are not only a talent in high-performance machining, but also in precision work. No wonder your boss is pleased with you at the moment. A salary increase is on the cards. But be careful not to rush things. A little diplomacy never hurt a Taurus.

Gemini

22 May – 21 June

Watch out, summertime is here! Things are starting to heat up for you, and the sparks are flying not only during laser cutting. Is a new love coming your way or is the old one just perking up again? Either way, the stars are auspicious for any romance. But don't lose your head at work – the consequences could be disastrous!

It's written in the stars. And you can read it here ...

Cancer

22 June – 22 July

You cut a fine figure at the EDM machine and your precision workpieces stand out with their immaculate surface finish. But beware: Jupiter's moon is currently spreading mischief! So make sure to wrap your intricate workpieces in sufficient bubble wrap. But don't burst any bubbles as the air you release comes from China.

Leo

23 July – 23 August

Thanks to the propitious alignment of the stars in the coming weeks, Leos won't put a foot wrong. So you don't have to make a big effort at all. Rely entirely on your instincts and proceed as intuitively as you do when operating the Advance CNC controls. If only life were always so simple!

Virgo

24 August – 23 September

In the coming weeks, the ongoing lockdown will get to you more and more, so you'll find yourself talking increasingly to your pets. But don't worry, this is perfectly normal in the circumstances. You only need medical help when they start talking back to you...

Libra

24 September – 23 October

As a Libran, you're well-known for weighing things up properly. But what about your work? Accuracy counts not only when aligning your grinding wheels. Stay concentrated and don't let yourself be distracted by petty things. If you want to really let off steam, the stars are in your favour in the middle of the month. But mind you keep the scrap to a minimum.

Scorpio

24 October – 22 November

You isolate yourself during the lockdown and do your own thing. But even your wire can snap one day. Who will then thread it back into the kerf? Work a little on yourself and your manners. You'll see how good it will do you. The stars are looking good for you over the coming weeks – make use of their energy!

Sagittarius

23 November – 21 December

Mars helps you to improve your performance considerably. At the moment you have as much staying power as the EDM system of the MP series and you relish your incredible productivity. Unwanted cogging is not to be expected from you in the immediate future. A word of advice from Erodia: Use this burst of energy not only at work, but also at home.

The Art of Economy

Publicise your Profile!

Would you and your company like to be in the next edition?

Then write to us!

MITSUBISHI ELECTRIC EUROPE B.V.
Mechatronics Machinery / Mitsubishi-Electric-Platz 1 / 40882 Ratingen / Germany
Fon +49 (0) 2102 486-6120 / Fax +49 (0) 2102 486-7090 / edm.sales@meg.mee.com / www.mitsubishi-edm.de

MITSUBISHI ELECTRIC