Issue 02/16

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MITSUBISHI ELECTRIC

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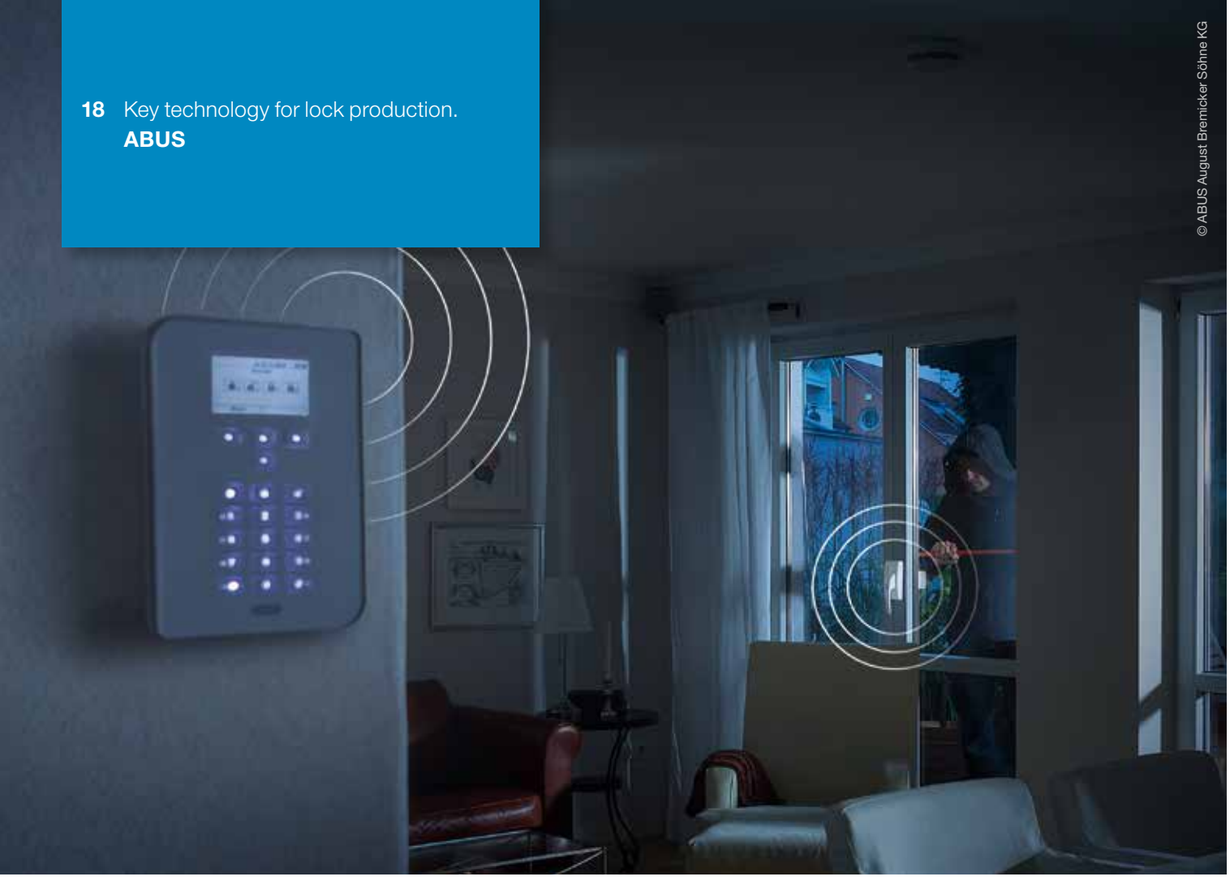
Profile



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Exciting reports from the world of wire EDM.

Editorial

Hans-Jürgen Pelzers

“Better safe than sorry.”

The subjects of safety and security are becoming more and more important.
ABUS Sicherheitsttechnik, for example, relies on a combination of mechanical and electronic protection, as you can read on page 18.

Safety is also often a big topic when it comes to EDM systems – and best of all in duplicate. Even with the very latest technology, optimum results are achievable only with extreme care and good planning. And if something is nevertheless overlooked, all wire-cutting machines from Mitsubishi Electric come with an inbuilt Crash Protection System (see page 60).

For the businessman as well, security is always important, in the sense of investment security. Buying a machine from the world market leader with thousands of satisfied customers is an assurance of reliable operation and protection of the investment in the long term. Durability at Mitsubishi Electric is a feature in-built at the design stage – solid steel, for example, is chosen for high workpiece loads. The convenient central lubrication system and Tubular Shaft Motor with a 12-year guarantee for positioning accuracy round off the package and add significantly to security.

As the Festive Season rapidly approaches, allow me to convey to you my advance Christmas greetings and wish you a good and successful start to the New Year in 2017.

Hans-Jürgen Pelzers
from the Technology Centre in Ratingen

News

7th-generation IGBTs: low power loss and high reliability

Mitsubishi Electric schedules shipments of new models of the T series power semiconductor modules. Equipped with 7th-generation insulated-gate bipolar transistors (IGBTs), they offer low power loss and high reliability with a voltage rating of 1.7 kV, perfectly meeting the demands of companies producing general-purpose inverters, photovoltaics (PV), wind power generation systems, elevators and much more besides.

Mitsubishi Electric to supply fastest elevators in South Korea

From a customer in South Korea, Mitsubishi Electric has secured an order to deliver two elevators which to Mitsubishi Electric’s knowledge will probably break all national records with a travel speed of 600 m/min. The elevators are intended for the LCT Landmark Tower in Haeundae, Busan, which will open for its intended purpose in 2019.

“The World of Mitsubishi Electric” – the movie!

Allow yourself to be captivated by the world of Mitsubishi Electric and get to know the company and its products. The innovative product exhibition “The World of Mitsubishi Electric” presents solutions, applications and products from our business units in playful and visually stimulating demonstrations. From an electric motor and robots to satellites. We are especially proud of the “Red Dot Award: Best of the Best” for our “THREEBOTS”.

www.mitsubishi-edm.de/me-movie-en

Cream cut

When automation OEM Newtech looked to design a new ultrasonic cutting machine for the bakery industry, it turned to Mitsubishi Electric for a fast, efficient, flexible and clean robotic solution. The result is an innovative machine design that can cut cakes to the highest levels of precision, working flexibly for different portion sizes and quantities, and eliminating problems of damaged product.

Enjoy your read of this issue!

Founded in
2006

20
employees

Production and machining of high-precision steel and cemented carbide tools and complete subassemblies

When it comes to perfection and precision, Hornung in Swabia is second to none – and has been aided by Mitsubishi Electric machines for generations.

Hornung GmbH

From one generation
to the next.

You don’t often hear of someone claiming to have been surrounded by wire-cut EDM systems as a child. But Andreas Hornung, today’s Managing Director of Hornung GmbH, fondly remembers the machines of his father’s firm. “Apparently I used to say in pre-school that I was going to work in the company when I grew up. I can't honestly remember this, but I do have a clear image of the first wire EDMs with their punched tape,” says Hornung about his first contacts with electrical discharge machining.

Ten years ago the big day arrived. Joining his father, Andreas Hornung put the company in Urbach on a new footing. While the firm had previously concentrated

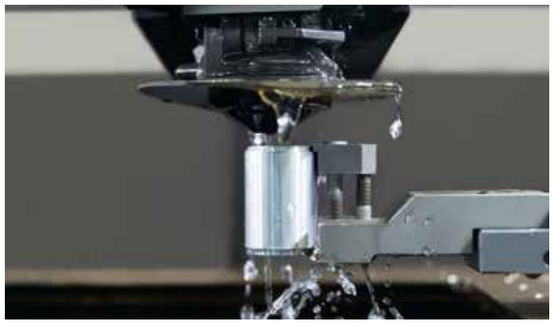
“A taper in a taper in a taper” is how Managing Director Andreas Hornung jokingly calls this item – in reality a clutch component for the automotive industry.

This V-bearing is used in the computer chip industry.

solely on mouldmaking, Hornung coupled his arrival with a shift in emphasis to the production of steel and cemented carbide tools and complete subassemblies.

Hornung’s very slogan of “Precision meets Perfection” suggests the importance attached to EDM technology. Although they provide all machining methods, wire EDM takes pride of place. It is here that the family-run company has acquired so much skill that it enjoys a reputation as a problem-solver well beyond the immediate region. “We’ve achieved a very high degree of vertical integration, so a batch size of 1 is pretty well standard,” Hornung explains. “We’re appreciated by our customers because we handle tricky components with very complex shapes – and because we deliver the finished parts quickly and often overnight.” This means that the increasing expectations of flexibility and rapid delivery have become part of day-to-day business. Time is wasted in a big way, he says, due to inaccurate drawings or the fact that design offices often lack the experience of what is technically feasible. In some cases, on the other hand, much greater accuracy is demanded than is actually needed. “This of course takes extra time for machining,” says Hornung, who is often on hand for advice in such cases.

Perfection Meets Precision – Hornung has a commitment to wire-cut EDM.



So that time is available for difficult projects, Hornung is dependent upon machines that run smoothly and for which a rapid trouble-shooting service is available in the event of a problem. “The Mitsubishi Electric service is brilliant,” says Hornung summing up his decade of experience.

Rapid re-tooling

Several wire-cutting machines from Mitsubishi Electric stand harmoniously in a row and are in constant operation. While the two FA 20s are already ten years old, they were joined in the machine park by the MV Series in only August 2015. Since very few jobs involve production series, this means that each of the three wire-cutting machines is re-tooled three to four times each day. “This is a trouble-free process,” says Hornung who didn’t take long to choose the new MV Series. “Our experience, particularly of the after-sales service, has been so positive that we didn’t want to change supplier.”

For the clocked machining of circular parts overnight they also purchased an additional powered axis. “The practical thing about this is that it has the same interfaces with the two older machines, so it can be used

> The accuracy of wire EDM has been setting the pace for decades. There are now so many machining methods, ranging from laser cutting and water jet cutting through to 3D printing. While many other methods have been superseded by these new technologies, wire-cutting is still out on its own.
>
> ***Andreas Hornung***
> Managing Director of Hornung GmbH

on all three machines,” Hornung adds. The servo-controlled B axis integrated in the machine CNC control permits wire-cutting of the rotating workpiece. Consequently, cutting a block into several parts and multi-sided machining can be carried out in a single clamping.

Dimensional accuracy

Hornung’s customers mainly come from Stuttgart and environs and include such big-name manufacturers as Daimler, Bosch and ZF. But its contacts also extend as far as France and Spain. For these customers, they mainly machine parts for the automotive sector, such as calibration measuring heads for diesel injectors. But they also regularly serve the electronics industry and medical technology, producing aids for spinal surgery, among other things. The most complicated components are now sent to Spain. The accuracy of the finished items is in the 2 µm range – despite the difficulties imposed by the often hot Swabian summers. “The rooms for our measuring and quality testing equipment are of course air-conditioned, and the production shop is due

Hornung’s speciality is its rapid conversion of the drawing into the design.

to be upgraded in the near future as well. All the same, the Mitsubishi Electric machine displays the necessary dimensional accuracy," says a delighted Manfred Weller, in charge of wire-cut EDM at Hornung and involved in wire-cutting for over 20 years.

There haven't been any problems, incidentally, with acclimatising to the machine. "The great thing about the user interface is that it's got something for everyone. Anyone can operate it – using the mouse, keyboard or touchscreen," says Weller. Although a simple keystroke is rarely all it takes for most jobs, Weller admits. "The machines from Mitsubishi Electric make a lot of tasks easier, but for our work decades of expertise are usually necessary. Only then can the customer's drawings and ideas be converted into a finished component."

The great thing about the user interface is that it's got something for everyone.

On the basis of Weller's experience, each new Mitsubishi Electric generation takes less time for machining than its predecessor. And this has an effect on wire usage and ultimately on energy consumption. Although energy efficiency was not the main reason for buying the machine, it's still an important factor for Hornung. "In our everyday work, energy consumption is not such a big issue, but the cost of energy is increasing year after year. So you have to offset this with energy-efficient machines," says Hornung. With the new machine of the MV Series, the company is quite a bit faster, which is due among other things to the automatic wire threader. Such integrated functions as the Corner Master also contribute to this. But what ultimately counts for Hornung, however, is the machine's precision. The surface quality of the workpieces, which can be of any commonly used material, is as fine as Ra 0.13 µm. "I initially thought these values were reserved for the glossy brochures, but our practical experience has confirmed them," Weller states.

Even after ten years, wire EDM has lost nothing of its fascination for Hornung. "No two workpieces are ever the same. How will the curve turn out? How will the wire perform? And you've only got one attempt once the plate has been clamped," says Hornung describing the daily thrill of machining. "At the same time, the opportunities for machining workpieces are endless." Hornung is therefore convinced that wire-cutting will stay out on its own in the coming decades.

www.hornung-erodieren.de

Company profile

Hornung GmbH

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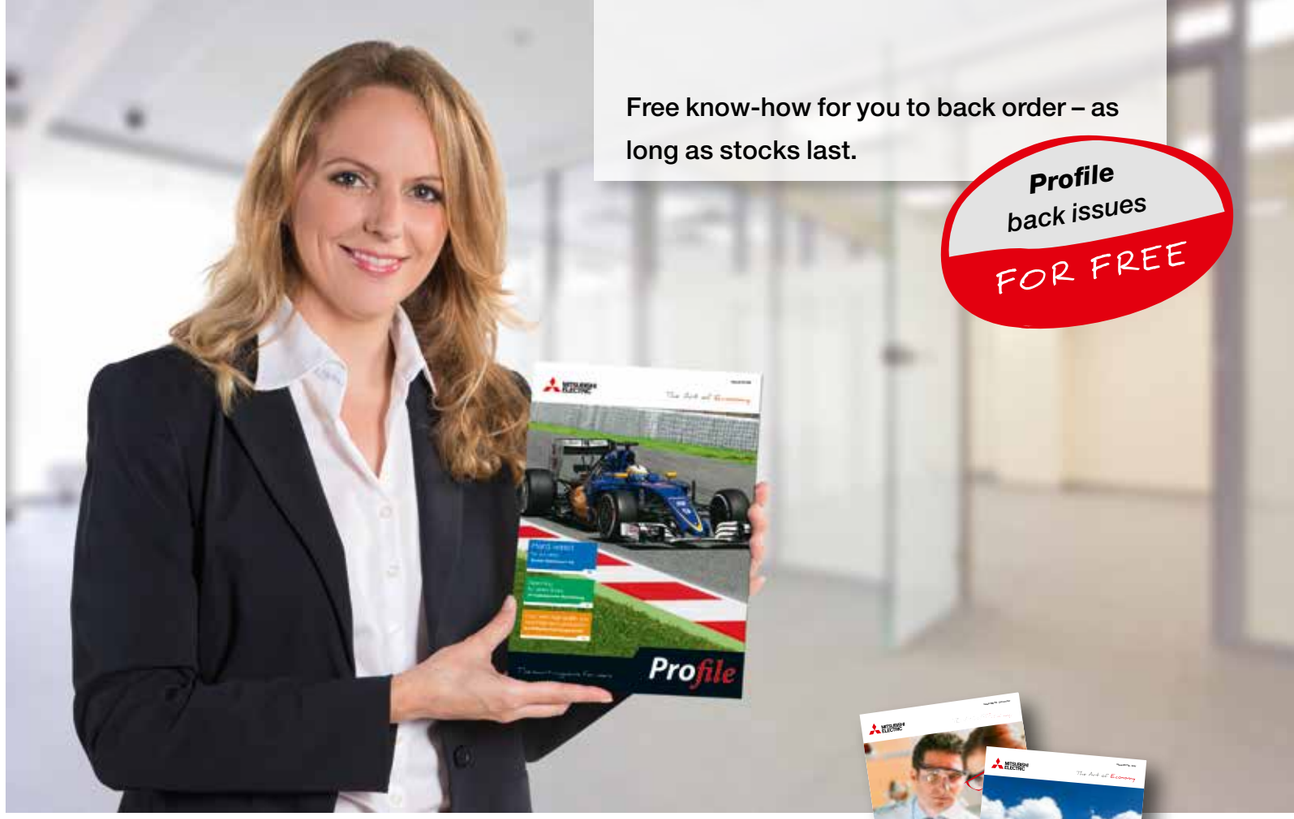
Managing Director
Andreas Hornung

Core business
Production and machining of high-precision steel and cemented carbide tools and complete subassemblies

Employees
20

Founded in
2006

Precision is what ultimately counts.



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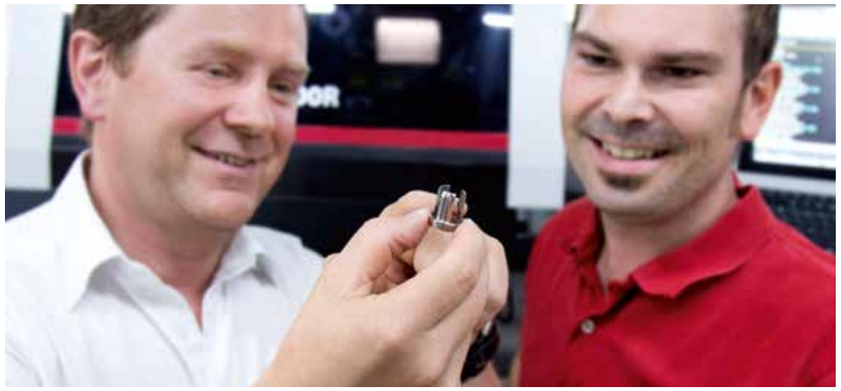
Founded in **1984**

50 employees

Subcontractor for everything from individual and replacement parts for tool- and mouldmaking, medical technology and automation equipment to ready-to-operate systems for automation in mechanical engineering and the food industry



Precision parts made of difficult-to-machine materials are preferentially processed with EDM at Schäfer Feinmechanik.

Schäfer Feinmechanik GmbH

Focus on precision.

EDM is the method of choice for hard materials.

Anyone committed to a reliable and swift single-source supply of anything from one-off and replacement parts to complete automation systems has to be very cautious in his choice of machining method. As far as Schäfer Feinmechanik in Oberndorf near Salzburg, Austria, is concerned, there's no serious alternative to electric discharge machining for the execution of complex geometries – particularly if the material is hard.

With its current roughly 50-strong workforce, the company in Oberndorf develops and fabricates a very broad range of items – ranging from one-off parts to complete devices and systems – for toolmaking, automation, medical technology and the food industry. Among elite athletes, Schäfer Feinmechanik also enjoys a fine reputation worldwide. Competitive shooters and biathletes appreciate the sports equipment developed and produced in Oberndorf as an assurance of their success. This sports equipment helped to win Gold and Silver at the 2012 London Games and Gold, Silver and Bronze at the 2016 Rio Games. "In our mechanical production department, we process some 6,000 to 7,000 different workpieces each year," Anton Ensinger, Schäfer's head of production in Oberndorf, reports. His primary goal is to uphold speed and accuracy in production – an all-important competitive factor for the company. As confirmed by Ensinger, customers today expect ever shorter delivery deadlines, over and above the quality and accuracy of the finished components and systems. "To satisfy these requirements, it is up to us to constantly accelerate throughput in production," Ensinger adds. This applies just as much to the one-off items and components for the equipment assembled on site as to the workpieces machined under subcontract for customers. The latter include single and

An assurance of success.

replacement parts for injection moulds and punching tools as well as components in small and medium series for automation systems or medical technology.

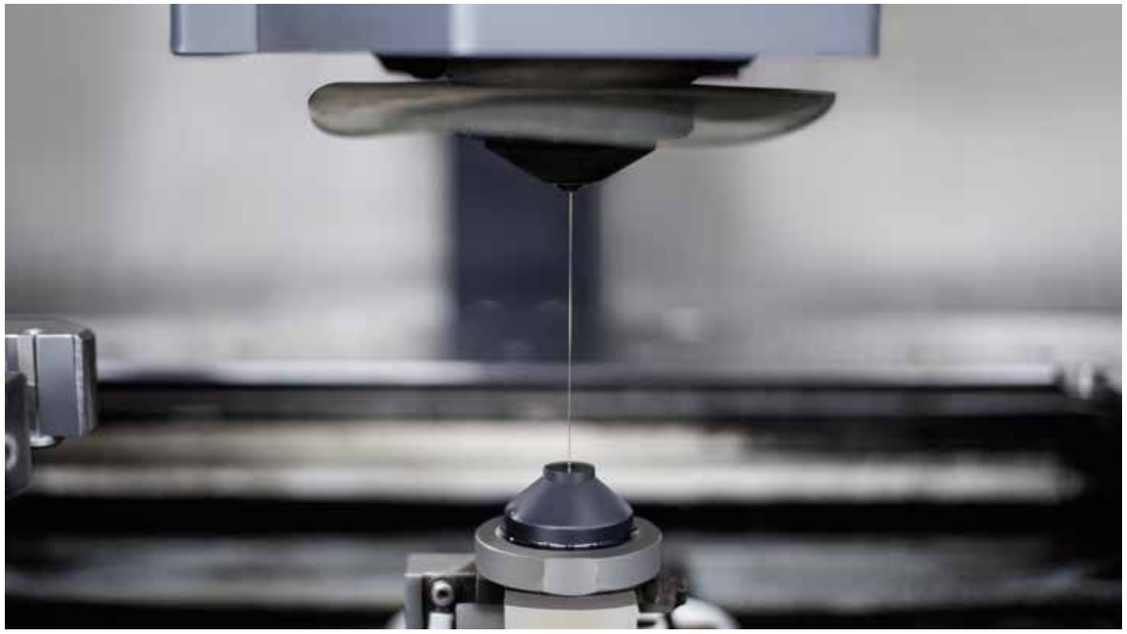
Customers benefit from in-house experience

To ensure rapid throughput and maximum flexibility in the development and manufacture of its own products – anything from automation solutions to gun stocks – Schäfer Feinmechanik has a high degree of vertical integration. Metalworking and welding work for machine frames are performed by the specialists themselves, as is the precision fabrication of small and super-small components for medical technology and tool- and mouldmaking. In addition, Schäfer Feinmechanik has several advanced 3D CAD CAM workstations. This is where the company designs and machines its entire product spectrum, ranging from single parts and sub-assemblies to entire configurations. The experience derived from this for production-ready design also benefits its subcontracting operations. Ensinger elucidates: “We also make use of our comprehensive design and production expertise to optimise the components machined under subcontract so that we can produce them faster, more efficiently and more reliably.” It often happens that unspectacular improvements in the design of components and subassemblies open up huge opportunities for simplifying and hence accelerating production and assembly to a large degree. And this of course cuts costs for the customer.

As Ensinger continues, there was a strong shift towards EDM a few months ago, accompanied by the desire for optimised production processes. “Wire-cutting is practically the only option for some machining operations, although we used to make only limited use of it,” he reports. Previously, it had been reserved solely for the small-scale machining of replacement parts for tool- and mouldmaking and for in-house requirements.

But that changed when Schäfer received a growing number of orders for the production of individual parts for punching tools and injection moulds in small and

For the machining of precise geometries in hard materials, there’s no alternative at Schäfer Feinmechanik in Oberndorf an der Salzach to wire EDM as a cost-effective and high-accuracy production method.



Ensinger: “Thanks to the harmonised system for operation and programming, our skilled staff were able to work productively with die sinking, a technology that was new to us, after only a short time for familiarisation.”

medium series. In Ensinger’s view, the only suitable machining process for this was EDM, as it is vastly superior to other machining operations, such as hard milling. It is capable of effortlessly and dependably achieving contour accuracies of 3 to 5 µm and surface qualities of Ra 0.3 µm, he stresses. Moreover, EDM is beneficial economically, despite the supposedly slower machining processes. As a mature and reliable production method, unsupervised running is possible in some cases, making multi-machine operation possible. Machining is also possible during entirely unsupervised night shifts. As Ensinger explains, he makes use of this particularly for highly complex components or for machining several components out of a single block.

Innovative technology from Mitsubishi Electric

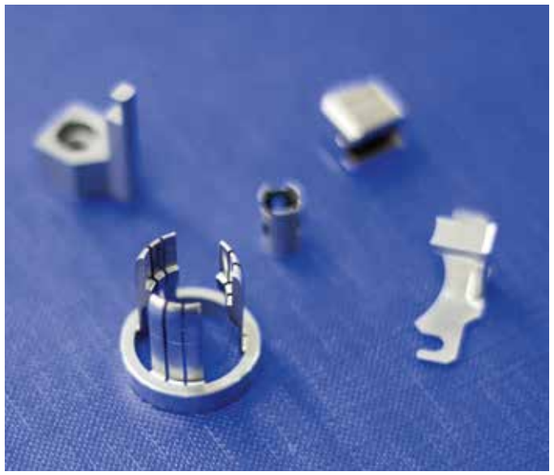
By investing in an EA8S die-sinking machine and an MV1200R wire-cutting machine, Schäfer extended its production capacity a few months ago. The two machines were purchased so that the company can continued to handle the growing number of subcontracted jobs on time. Ensinger aims to build on the production expertise already available at the firm. “Every machining technology available in-house boosts our flexibility and contributes to faster throughput,” he adds. The production technicians opted for the EA8S from Mitsubishi Electric because they were thoroughly impressed by the quality and performance of the FA10S wire EDM.

Wire-cutting is practically the only option for some machining operations.

“The FA10S was entirely up to our expectations. So it made sense to invest in a die-sinker from the same manufacturer.” Mitsubishi Electric also made a good impression with its high-grade equipment coupled with unbeatably attractive pricing. The choice of the EA8S was vindicated in only a few weeks. With minimal outlay on instruction and familiarisation, staff were able to work productively on the EA8S only a few days after commissioning, aided in this by their extensive experience of the FA10S wire-cutting machine and the recently commissioned MV1200R.

On Mitsubishi Electric’s machines, the operation and control interfaces are based on a single system. On the EA8S die-sinking machine, ESPERADVANCE dialogue programming with graphic support simplifies and accelerates machine set-up and the machining process considerably. A large number of machining cycles

In the production of intricate parts for tool- and mouldmaking, medical technology and automation equipment, there is no serious alternative to EDM, Ensinger believes.



can be selected in a library. The operator and tool setter merely has to add the pairing of electrode and material. Ensinger reports that, for instance, when producing tapered gate bores with diameters of only 0.7 mm, his machinists have managed to cut set-up time by up to 30 per cent thanks to the mature machining cycles. The control automatically selects the matching technology parameters and generates the cutting programs. The tool setter is then assisted by the Auto&Easy Setup system developed exclusively by Mitsubishi Electric. The machine automatically scans the clamped workpiece and the electrode in order to precisely record its position and enter it in the cutting program to determine zero. With the support of this outstandingly simple programming and operation, Ensinger reports, staff took very little time to learn the ropes with the new technology. Thanks to its automatic tool changer for up to 10 electrodes, the EA8S operates particularly cost-effectively and is capable of fully machining complex components in a single operation, working for long periods and in some cases throughout unmanned shifts. Short machining times due to high removal rates are made possible by the IDPM generator technology, which also reduces electrode wear significantly when graphite electrodes are used.

Ensinger is also highly appreciative of the MV1200R wire-cutting system purchased a few months ago which machines faster than its predecessor. In tandem with the absolutely dependable automatic wire threader, it boosts the productivity of wire-cutting by up to 30 per cent and is capable of working trouble-free during unsupervised night shifts. The specialists in Oberndorf produce their cutting programs at an external CAD workstation, sending them to the machines via a DNC network. Another benefit of the MV1200R is its high energy efficiency, says Ensinger. Because Schäfer Feinmechanik attaches special importance to conserving natural resources. For example, the company generates the power needed in production with its own fully independent photovoltaic installation on the production building. Given growing production capacity, in-house power generation can only be continued with efficient and energy-saving production equipment. The MV1200R, Ensinger stresses, meets the requirements with its limited power needs.

At Schäfer Feinmechanik the EA8S from Mitsubishi Electric proved its worth after only a few months.

A preference for machining difficult components

In view of their wide range of advantages, Ensinger relies heavily on EDM technology from Mitsubishi Electric. “EDM is a proven, absolutely process-secure and highly efficient and cost-effective technique,” he explains. “It is particularly suitable for precision components made of difficult materials. We therefore aim to handle difficult workpieces made of hard materials with EDM rather than hard milling, for example.”

www.schaefer-feinmechanik.at

Interview

Anton Ensinger
Production Manager

Can you explain in a few words what your company does?
We design, produce and assemble everything from metalwork to items machined with µm precision.

What’s your source of motivation in your work?
I put my heart into exploiting new technologies and improving the quality of the items we produce.

What’s different about how you do things now, compared to five years ago?
Today we work a lot with CAD/CAM systems to accelerate throughput and achieve more stable processes.

What was your biggest business success?
The successful adoption of 5-axis technology enabling us to fully machine many components.

What’s your favourite way to unwind outside work?
I enjoy climbing and skiing in the surrounding mountains.

What failings in yourself and others do you find easiest to forgive?
Frankness and honesty in admitting mistakes for which we can jointly search for a solution.

How would you explain your work at the company in a few words to someone with no technical knowledge?
I’m in charge of production in a mechanical engineering company.

How do you attempt to conserve resources and be energy-efficient?
We generate most of the electricity we need ourselves with our own solar cell installation on our production building.

Company profile

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Founder
Karl Schäfer

Core business
Subcontractor for everything from individual and replacement parts for tool- and mouldmaking, medical technology and automation equipment to ready-to-operate systems for automation in mechanical engineering and the food industry

Employees
50

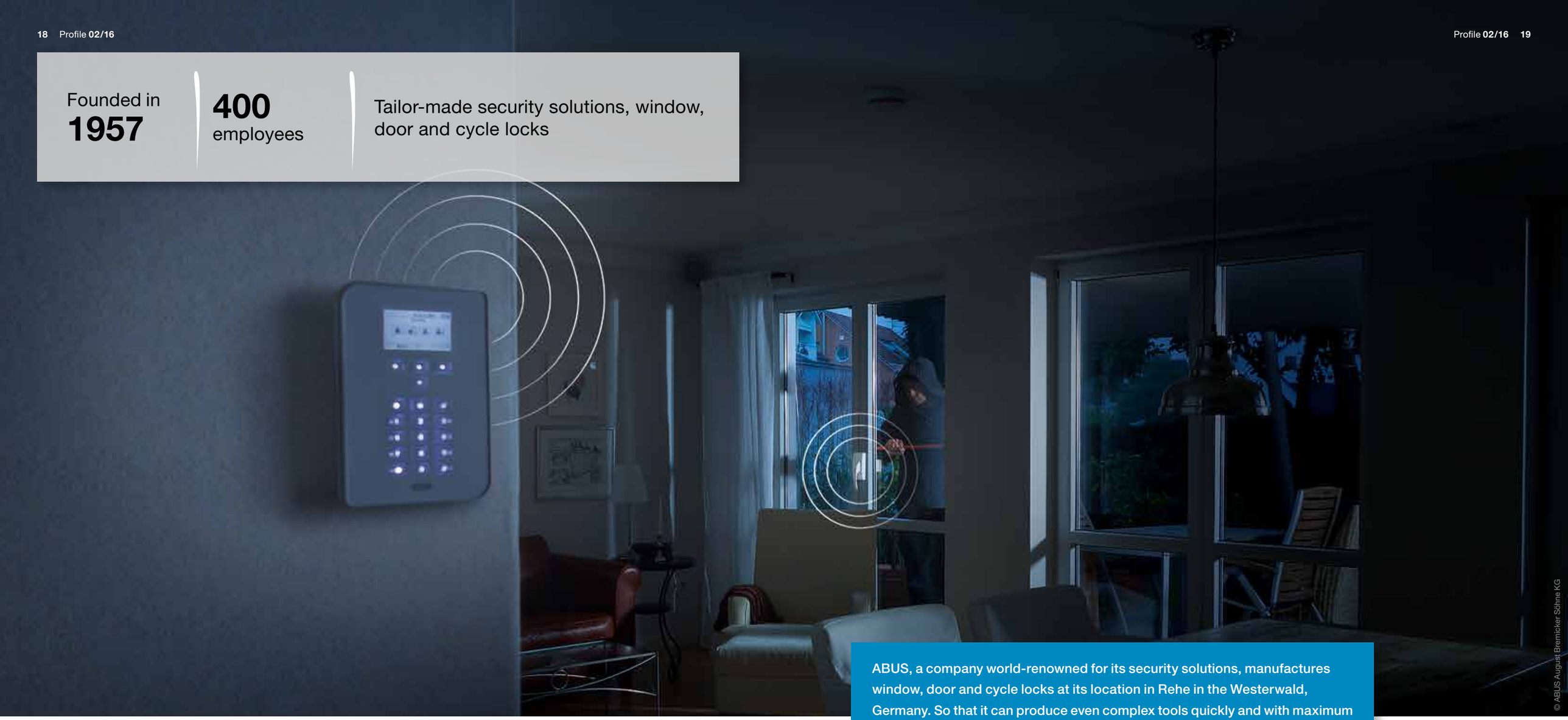
Founded in
1984

EDM – proven, process-secure, high-performance and efficient.

Founded in
1957

400
employees

Tailor-made security solutions, window, door and cycle locks



ABUS KG

Key technology
for lock production.

ABUS, a company world-renowned for its security solutions, manufactures window, door and cycle locks at its location in Rehe in the Westerwald, Germany. So that it can produce even complex tools quickly and with maximum precision, its experts resort to high-tech EDMs from Mitsubishi Electric.

Burglary is flourishing in Germany: in 2015, burglars broke into private homes almost 272,000 times, and intruders broke in another 67,000 times without leaving a trace – simply because a window tilted open was an invitation to them. But more and more home owners are evidently declaring war on unwanted visitors, as the demand for security systems is steadily growing. ABUS August Bremicker Söhne KG from Wetter in Westphalia has been one of the prime movers and innovation leaders on the market since 1924. It develops alarms, window and door locks, locking systems and video surveillance for security at home and all kinds of locks and securing mechanisms for bicycles and motorcycles – anything that promises

Abus KG

There's steady growth in demand for security technology.

Numerous awards

German world market leader
On 27 January 2015, the “Lexikon der deutschen Weltmarktführer” (Encyclopaedia of German World Market Leaders) of business publisher Deutsche Standards EDITIONEN celebrated its premiere in the context of the Summit of World Market Leaders at Kunsthalle Würth in Schwäbisch Hall. With an entry in the new edition, ABUS as a family-run company with a global market presence in the 10th decade of its existence has again been commended by editor and publisher Dr Florian Langenscheidt and Prof. Dr Bernd Venohr.

Most innovative brand of the year
At a gala in the old Bundestag parliament building in Bonn, ABUS received the Most Innovative Brand Award and hence the most prestigious commendation from the Plus X Award on 18 June 2015. What is hailed as the biggest innovation prize for technology, sports and lifestyle products thus commends the security expert for its many innovations in the field of electronic security technology. Having won this high-calibre award in 2013, this is the second time that ABUS has beaten all its rivals in the Electrical and Media Technology bracket and been selected as the year’s most innovative brand.

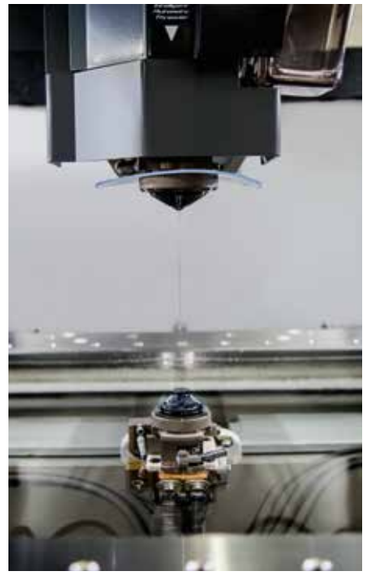
Brand of the century
The cream of German brands was commended by business publisher Deutsche Standards EDITIONEN in Berlin in 24 November 2015. Security specialist ABUS again confirmed its status as a global brand and was commended as one of the best German companies as a Brand of the Century. In a ceremony, the “Stars 2016” award was presented by publisher and editor Dr Florian Langenscheidt to the stars in the firmament of German brands.

Images: © ABUS August Bremicker Söhne KG

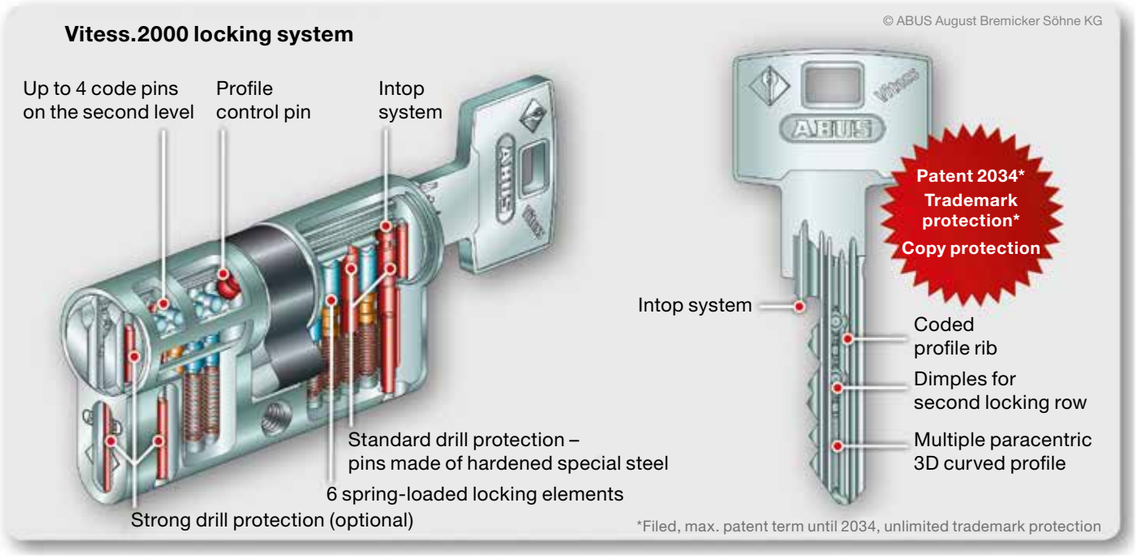
dependable protection from burglary and theft can be found in the ABUS portfolio.

The research and development centre and the main production installation for window, door and cycle locks in Rehe in the Westerwald are of outstanding importance for the company group. 400 people are currently employed at the location in existence since 1957 and bear a high degree of responsibility. Because parts production and assembly at ABUS are carried out on the “one-piece flow” principle in which employees do not stay in one position on the production line while parts move from one station to the next, but accompany the workpiece on its entire journey, advancing steadily from one processing stage to the next through to its completion. The advantage of this modus operandi is that employee motivation remains high thanks to his or her full responsibility for the product. In addition, it is easier to keep track of workpiece quality, and delivery times are shortened.

Technology leader thanks to superlative precision
Another key quality aspect is that the security experts in Rehe produce their own tools and special machines. This is because the production of locks and security products is precision work that



Progressive technology: if the cutting wire of the MV2400R breaks, the system rethreads it automatically and with precision.



Parts are produced and assembled in one-piece flow.

Precision starts with set-up – the MV2400R helps here with ergonomic access to the machine.

would not be possible without specially designed tools and machines. “Only with our own technology are we able to achieve the proverbial German precision that ABUS is accustomed to,” says Georg Neufurth, Head of Technology and Organisation in the Rehe toolmaking department. The tool and machine parts required for lock production, such as punching and other dies, mould slides, shifting links, and guide and holding plates, have to be machined with hundredth-millimetre precision out of the metal blanks. This rigorous stipulation also applies to the production of the mould cores required for the construction of high-pressure zinc casting dies, injection moulds and prototypes. The first samples of newly developed locks are produced in Rehe, which are then tested exhaustively in the ABUS laboratory before they go into mass production. “We therefore have to be sure of achieving the highest possible precision and surface quality,” says Neufurth.

Because of these exacting requirements, ABUS makes use of machines from Mitsubishi Electric for wire-cut EDM. And has been doing so for over 15 years, as Michael Zeitz, Head of Toolmaking, explains: “We’ve been cultivating a strong partnership for many years. We have always been well looked-after, and the after-sales service is quite outstanding. If problems ever arise, the Mitsubishi Electric technician is immediately available on the other end of the line or calls back after a very short while.” Only a few months ago, the toolmakers sold an FX20K that had been running smoothly since 1999 to a firm nearby and invested in an MV2400R to replace it in July. This now supplements the Mitsubishi Electric FA20V wire-cutting machine that has been performing reliably at ABUS since 2006. The toolmakers expect the new MV2400R to make production even more efficient and faster. “We are the technology leaders and therefore have to take pains to keep our production equipment in line with the state of the art,” says Zeitz. Before purchase, Neufurth adds, they had compared the MV2400R with other wire-cutting machines on the market. “But we soon came to the conclusion that the MV2400R with its many functions, equipment features and optional extras suits us best. The Mitsubishi Electric price/performance ratio is just right, so we stayed with the same manufacturer.”

Reliable wire-cutting around the clock

The positive verdict of the ABUS experts is based among other things on the advanced drive technology using Tubular Shaft Motors. Together with the linear scales on all axes and the rapid optical data transmission, the MV2400R ensures maximum accuracy at high working speeds and permits efficient multi-sided machining in conjunction with an additional axis integrated directly in the Mitsubishi Electric CNC. “This is a very useful feature for us,” says Neufurth. Another important function for him is the automatic wire threader that can also work in the dry and thus also offers solutions in special threading situations. In the dielectric as well, the machine always finds the breakage position and reliably rethreads the wire. This not only saves time, but also permits unmanned operation at night. This feature is readily exploited in Rehe. “We set up the tool workpieces in the evening and have them machined overnight so that we can finish them the next day. This saves us a lot of time,” says toolmaker Steve Ebers, one of three employees at ABUS who regularly work on the MV2400R. Another bonus in this respect is the machine’s zero-point clamping system, which markedly reduces set-up time and thus accelerates production, says Ebers. The work table accessible from three sides is ergonomically aligned to the z = 0 level, which means that workpieces

More and more break-ins

The police crime figures show that the number of break-ins in Germany has been increasing sharply for years. Police officials recorded over 167,000 attempted and successful break-ins, which is 50 per cent more than in only 2008.The clearance rate for this criminal offence is relatively low at 53.4 per cent.

The hot spots for burglaries include the Ruhr district, Hamburg and environs, Berlin and Bremerhaven. In Dortmund there are 578 burglaries per 100,000 inhabitants. This compares with only 14 in the Bavarian rural district of Freyung-Grafenau.
Investigators attribute the rise above all to professional, highly mobile gangs from abroad. In the case of domestic burglaries, the statistics reveal a disproportionately large increase in organised, travelling groups of offenders from South Eastern and Eastern Europe.
The basic problem is that intrusion into homes is a very low-risk and nevertheless lucrative form of crime. What’s more, the criminals can travel with their loot without difficulty back and forth throughout the EU.

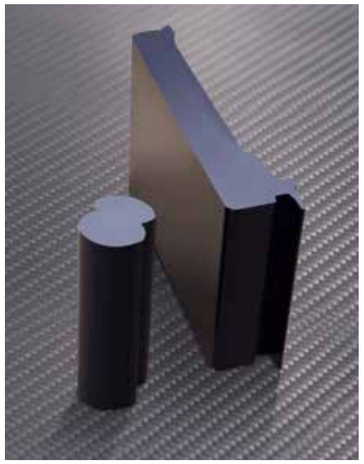
Thanks to its integrated test units and its multiple paracentric curved profile, the Vitess locking system from ABUS provides protection from tampering with the cylinder and illegal key copying.

Innovation at ABUS: a new MV2400R has been adorning the EDM department of the security specialists since July of this year.

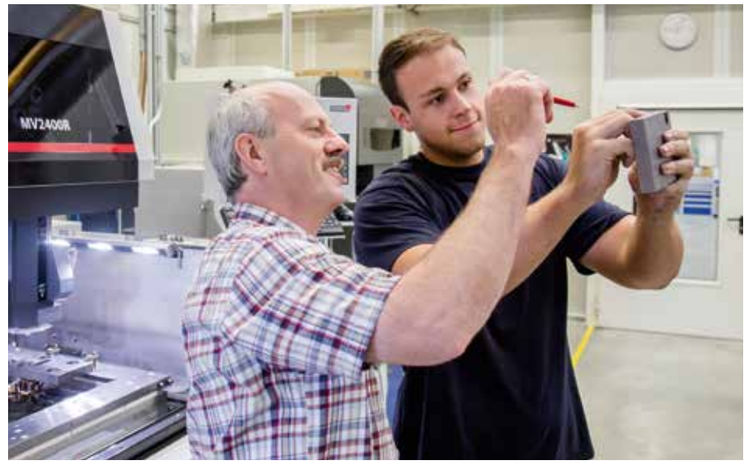
can be perfectly positioned even without clamping bars. “The parts can thus be machined with greater precision.” It didn’t take long for the ABUS specialists to acclimatise to the new MV2400R, as Mitsubishi Electric has a policy of adapting the user interfaces of its current control generation to that of the predecessor machines. This way, operators can build on their experience of older Mitsubishi Electric machines. “We were able to make use of the functions and options after only a short while,” says Ebers.

Easy programming, rapid production

In Rehe the CAD data required for machining, such as the geometry of the desired finished parts, are prepared by the responsible mould and tool designers. The programming proper of the MV2400R then takes place in the programming office of the ABUS EDM department where the machines are supplied with the data generated on the computer. Here, again, the operators can draw on their existing experience with Mitsubishi Electric, although the MV2400R permits further-improved generator settings. They can resort to the integrated database and store individually configured technology parameters there. And thanks to the progressive programming and operating strategy, toolmaking at ABUS was up and running within just a few days. The fact that ABUS’s precision and quality strategy is proving effective with key support from Mitsubishi Electric is illustrated by the growing demand for the security products of the Westerwald company. Owing to the plant’s high workload, ABUS is currently extending its production site in Rehe by 3000 square metres. 70 new jobs will be created in the new production shop scheduled to go into operation at the beginning of 2017. “The extension of capacity clearly expresses our commitment to the Rehe location and German manufacturing,” says Neufurth. And the next stage of extension is already in the pipeline. This envisages among other things a revamp of ABUS’s academy, quality assurance and test laboratory. Mitsubishi Electric is one of the technological pillars of this growth.



Key equipment: for quality reasons ABUS produces its tool parts and dies for lock production itself.



Precision is called for at ABUS and the MV2400R is more than a match for these high expectations.

Image (above): © ABUS August Bremicker Söhne KG

ABUS KG in brief

ABUS KG is part of the ABUS Group that supplies markets on all continents with tailor-made security solutions.

The ABUS Group has 3,500 employees worldwide, 400 of whom work at the Rehe location in the Westerwald.

The research and development centre as well as the main production plant for window, door and cycle locks have been domiciled here since 1957. Mitsubishi Electric has been equipping tool production in Rehe with EDM systems since 1999.

www.abus.com

In recent years, Japan has developed into one of the leading nations in the use of electric vehicles. This article tells you how the trend will continue in future and how car developers in the Far East are contributing to technological progress.

Japan Special

Zero emissions –
Japan shows us how.

Japan leads the way with electric cars

When one looks at the use of electrically powered vehicles worldwide, Japan stands out as one of the leading nations. Currently there are already more charging points around the country than petrol stations. Throughout Japan, vehicles can recharge their batteries at over 40,000 charging points, while there are only 35,000 petrol stations. By comparison, US citizens have at their disposal only 9,000 charging points as against 114,500 petrol stations. So, compared to the US population, the Japanese have far better access to electricity for their vehicles per person. On the technical side, battery development has reached the point where a full charge is sufficient for

More charging points for cars than petrol stations.

172 kilometres. The Electric Vehicle from Mitsubishi Motors, formerly known as the i-MiEV, has currently become established as the standard vehicle for road use in Japan. Back in 2011, the car received the Plus X Award for the best electric vehicle worldwide. The model has also won the Alternative Energies Cup of the International Automobile Federation (FIA) on two occasions.

What makes the Mitsubishi Motors Electric Vehicle so special

The Mitsubishi Motors Electric Vehicle went into mass production in June 2009. Only a year later, the first models arrived on the European market while the Japanese had already familiarised themselves well with the car. In 2012 and 2014, the Mitsubishi Motors car was given a facelift and many practical features, and the range of a battery charge was increased. Further progress can be expected in this area in the coming years. Its drive is a permanent-magnet synchronous motor with power output of up to 29 kW and torque of 180 Nm. The motor was installed at the rear of the vehicle under the boot, which, logically, is where the connection socket for the charging point is located. The best ambient temperature for the battery is +12 °C to 31 °C – in such conditions the battery delivers full power. Temperatures above this range can be expected to cause serious energy loss, while at temperatures below 12 °C power output declines slightly without impairing durability. With these features, the Electric Vehicle is ideal for daily usage in Japan's climate. It is important, however, that the temperatures stay within the range of 12 °C to 31 °C during the charging process so that the power can efficiently charge the battery cells.

A look ahead at electric vehicles on Japan's roads

One reason for the popularity of electric vehicles in Japan is undoubtedly government policy. The government has been subsidising manufacturing companies and buyers with attractive tax benefits for many years. What's more, the price of charging is much lower than for conventional refuelling. The government has itself promoted the establishment of charging points and has helped to set up a GPS system that identifies the charging point closest to the moving vehicle, guiding the motorist straight there.

Internationally, Japan is certainly setting a fine example that other countries could follow. The USA, China and Europe have been observing the Japanese approach with great interest and will probably adopt it in the future for the changeover from conventionally fuelled to electric vehicles. Some German car manufacturers are endeavouring to make charging points more efficient and to accelerate the charging process in Germany. In the meantime, Japan will have made further progress. Mitsubishi Motors and other companies are busily researching ways of making the driving experience more pleasant and improving performance further. At the renowned Toyohashi University of Technology in Aichi Prefecture, the world's first electric vehicle has been unveiled that does entirely without a battery. Nevertheless, before it will make it onto the road, an electrified surface will be required. The power is transferred to the vehicle by induction. At the same time, however, Japanese developers have rejected the complete rebuilding of the road network, preferring the intelligent electrification of existing roads in Japan instead.

In Japan there are many more charging points than conventional petrol stations.

Progressive: the range of a charged battery is far greater today than only a few years ago.

Ideal for daily use.

Founded in **1990**

5 employees

One-off and replacement parts for cutting and punching tools for telecommunications, medical technology and automotive engineering

Impressing with maximum quality and flexibility.

USIMICRON's efficient toolmaking team in Besançon give precedence to wire-cut EDM.

USIMICRON

Staying competitive
in Europe.

In the production of replacement parts and components for cutting and punching tools, USIMICRON in Besançon, France, is able to hold its own against East Asian and Indian competition thanks to the cost-effective and reliable wire-cut EDM systems from Mitsubishi Electric.

"We want to use EDM increasingly so that grinding becomes superfluous," says Alain Perrenoud. He is the owner and Managing Director of today's USIMICRON. A toolmaker by trade, he founded his own company in 1990. Specialising in individual components and replacement parts for cutting and punching tools, and particularly high-precision punches and dies, the production firm grew to 20 employees until the global financial crisis in 2009. Following the insolvency of the old USIMICRON firm, the owner continues to run the business under creditor protection. "I was fully convinced of what our firm was capable of. I also saw excellent opportunities for attracting customers with our outstanding quality and flexibility and thus continuing to gain valuable contracts from the region," Perrenoud continues.

The success over the years since has confirmed his convictions at the time. Today, five skilled toolmakers machine precision parts in Besançon for other toolmakers. His customers include not only small and medium-size firms in the region, but also large companies and internationally active corporations. "We produce one-off parts and small series firstly for telecommunications and medical technology

and secondly for automotive component suppliers," Perrenoud confirms.

High-precision profiles

Working as a subcontractor, USIMICRON produces punches and dies for cutting and punching tools on the basis of drawings or samples. It is often a question of replacement parts for worn originals. And it is here in particular that the accuracy of the components determines how reliably they work. As replacement parts, they have to exactly fit the other components of the in most cases complex punching and cutting tools. Customers mainly demand accuracy of better than ± 2 µm, Perrenoud explains. Most of the punches and dies have challenging geometries and radii of less than a tenth of a millimetre often have to be machined. What's more, the punches and dies are made of special steels and tungsten carbide. This applies, for example, to tool inserts for the punching and bending of small plug connectors or for the cutting of SIM cards for telecommunications equipment. Similar demands are associated with the production of tool inserts for cutting and punching tools in medical technology and automotive engineering. Since the replacement and one-off parts are used in toolmaking all over the world, USIMICRON obviously has to ensure their accuracy and quality. As Perrenoud reports, grinding used to be the only way of achieving the geometries on these workpieces. In his view, however, grinding is a time-consuming and labour-intensive method. "For two grinding machines, I need two experienced and highly skilled employees. These have to prepare the grinding process meticulously, set up the machines and then constantly monitor the grinding process," Perrenoud continues. But this is extremely expensive. Jobshops in high-cost production locations in Europe have to compete with lower-price rivals in India and East Asia, for example. If they want to survive in the long term, they have to opt for more cost-effective and yet high-precision and dependable machining methods.

Cutting costs with EDM

Several years ago, Perrenoud therefore started to wire-cut certain components. He chose wire EDMs from Mitsubishi Electric for a large number of reasons, he claims. From the exclusive dealer of the brand for France, Delta Machines, he was given a detailed technical briefing at short notice. He was able to fully rely on the service and skills of the employees of the dealership. In addition, he was impressed by the high-grade equipment and outstanding features of the wire-cutting machines – first and foremost of the recently additionally purchased MV1200R. The MV1200R with its DFS fine-finishing generator thus achieves surface quality down to Ra 0.1 µm. Accuracy of ≤ 2 µm coupled with high working speeds is ensured by the modern drive technology consisting of Tubular Shaft Motors in combination with the linear scales on all axes and rapid optical data transmission. Although wire-cutting is at first a time-consuming method, it has boosted the competitive standing of USIMICRON. For after set-up, the machine operates for many hours totally without supervision. Firstly, this reduces personnel costs, Perrenoud explains, and the firm, thanks to the machine's dependable machining performance, can now exploit previously unproductive periods, e.g. night shifts. So that the machines can operate unmanned for as long as possible, the specialists at USIMICRON cut several punches and dies out of single blocks. In the case of dies with highly elaborate geometries, several penetrations and drilled holes, machining can take up to 48 hours. The MV1200R runs trouble-free without an operator for this period, in part because of the reliable wire threader. And seemingly little-noticed details, such as its ability to cut a multitude of materials with inexpensive uncoated brass wire, contribute to the cost-effectiveness of the wire-cutting machines from Mitsubishi Electric. USIMICRON generates the NC programs for wire EDM using drawings in DXF format at an external programming workplace. Because of the easy-to-grasp, ergonomically designed programming and control interface at the machine, the employees were very quickly familiar with the technology. This was largely made possible by the several days' staff training by Delta Machines. The MV1200R can also be quickly and conveniently set up, thus keeping idle time short

Alain Perrenoud, USIMICRON; Joël Martin, Product Manager for EDM systems from Mitsubishi Electric at exclusive dealer Delta Machines in France; Kersten Juhls, Regional Sales Manager for EDM systems at Mitsubishi Electric; and Sébastien Devernay, USIMICRON, have collectively chosen the MV1200R, the best-possible machining solution for USIMICRON.

Sébastien Devernay: "The MV1200R is quick and easy to set up. This minimises unproductive time and ensures maximum flexibility."

Component accuracy is all-important.

Maximum precision is called for in the machining of replacement parts for punching and cutting tools for the production of tiny components in medical technology and telecommunications.

USIMICRON uses wire-cutting to machine the tiniest radii and inner contours on tool inserts cost-effectively and with high precision.

and boosting flexibility. USIMICRON benefits from this particularly when machining small components. Wire-cutting then usually calls for only two to four hours of pure machining time.

Perrenoud is thoroughly impressed by the advantages of wire EDM on machines from Mitsubishi Electric, summing up his positive experience as follows: “Wire-cutting on the dependable and efficient machines from Mitsubishi Electric has had a large hand in our ability to stand our ground in the face of competition even from East Asia and India. With the MV1200R wire-cut EDM system, we are able to process our jobs inexpensively, flexibly and quickly. This way we can give ourselves that all-important competitive edge to keep us in business in France.”

USIMICRON

Alain Perrenoud, owner and Managing Director of USIMICRON in Besançon, and Sébastien Devernay, toolmaker and EDM and grinding specialist, checking the quality of the wire-cut components

Company profile

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Managing Director
Alain Perrenoud

Core business
One-off and replacement parts for cutting and punching tools for telecommunications, medical technology and automotive engineering

Employees
5

Founded in
1990

Interview

Alain Perrenoud
Owner and Managing Director

Can you explain in a few words what your company does?
We produce difficult, highly accurate, individual shape-imparting parts for cutting and punching tools.

How did you earn your first money?
I trained as a cutting machine operator, lathe operator and toolmaker and worked in these areas until I founded USIMICRON in 1990.

What’s your source of motivation in your work?
I’m convinced that it is worth investing in new technologies. This is the only way that the company can flourish in the long term under difficult conditions.

What’s different about how you do things now, compared to five years ago?
Partly thanks to new technologies, we are much less expensive and more flexible today than several years ago. We have learnt many lessons and now go about our work with greater composure and confidence, even in a difficult business environment.

What was your biggest business success?
After the global financial crisis in 2009, we succeeded in regaining the confidence of the banks and regional customers and in keeping USIMICRON going as a business.

What’s your favourite way to unwind outside work?
I do a lot of sport together with my wife Isabelle and attach great importance to high quality of life outside my work.

How would you explain your work at the company in a few words to someone with no technical knowledge?
I produce replacement parts for tools that are used in the construction of cars and in the production of medical technology and telecommunications equipment.

Founded in
1974

25
employees

Production of tools for the deburring of high-pressuring casting dies for aluminium and magnesium

Until not so long ago, aluminium in the automotive sector was reserved for the top end of the market or certain engine components. Today, the material is put to much broader use. And this means millions of parts that have to be deburred. To this end special and often complex deburring tools are required, and their punches and dies usually have to be wire-eroded. This is where Mitsubishi Electric plays a particularly helpful role.

Farina Marco

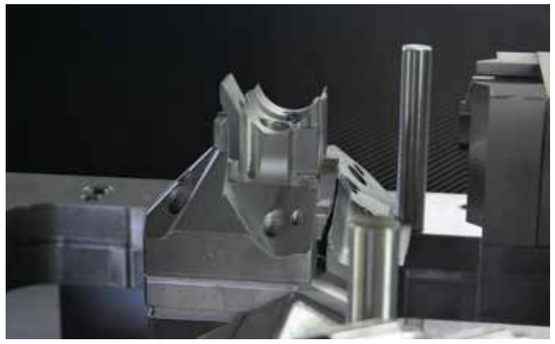
Making a name for itself
with complex solutions.

Covers, engine housings, brackets and other engine components: the aluminium and magnesium components, among other things for the automotive industry, are produced by high-pressure die casting with a cycle time of roughly 30 seconds. After this, robots handle the deburring and fine cleaning steps. Until the end of the Nineties, these operations were performed manually, with a cycle time of 3 to 4 minutes – too long for the pace of today's production, not to mention the strong variations in the results, depending on person and workload in an unhealthy environment. Even the use of robots has not radically reduced the time taken, as the process is still sequential and hence slow. For this reason, special deburring tools have been developed that

Farina Marco

Wire-cutting punches and dies for complex deburring tools.

Example of a fairly complex and extensive aluminium part, deburred and cleaned with a tool from the company in Cantù



Detail of a punch on a tool largely machined with the Mitsubishi Electric MV2400S

precisely replicate the geometry of the various components. As a result, the workpiece is picked up at outlet and all the fine work performed in one go at the end of the line. In this way, risers and runners are eliminated and the parting lines and existing holes and eyelets are immaculately finished. These operations call for the use of mobile devices such as hydraulic tool carriers, saw carriages, drilling equipment and even thread cutters.

The design and manufacture of these often elaborate and complex tools is today the core competence of Farina Marco, which has its headquarters in Cantù in the Italian Province of Como. The company founded in 1974 started out by making progressive composite and deep-drawing tools. This line of business was pursued for several decades, although the market changed enormously over the years. The firm in Lombardy responded quickly to the changing needs and has focused on deburring tools. In doing so, it has specialised increasingly in the design and production of truly high-tech machine tools.

Today, the company is noted for the high quality of its products and its competitive, punctual and adapted service. Always searching for innovative solutions capable of boosting tool performance, the business has set itself the goal of eliminating all manual operations.

Sights set on Northern Europe

The company mainly serves foreign customers, Sales Manager Cristian Farina confirms: “We work for the household appliance and furnishing sector, although the automotive industry remains our core business sector. We have many customers in the UK, Spain, France, Germany, Austria and Eastern Europe. Normally we produce prototypes, but sometimes we build two or three identical models. Nowadays, car makers upgrade their product ranges much more frequently, and each year they introduce new components that used to be made of sheet metal or didn’t exist at all. The advance of the electric car, for example, has brought with it a whole series of housings and devices made of aluminium that were previously unknown.”

The company’s quality conforms to ISO 9001:2000 and the highly skilled workforce has at its disposal a latest-generation machine park that includes machining centres, CNC lathes and wire-cut EDM systems. The last-mentioned technology is used particularly for the construction and final machining of punches and dies, as the most recent installation of a Mitsubishi Electric MV2400S shows. This machine achieves outstanding surface quality coupled with superlative machining precision and makes use of an innovative and high-performance communication system (CNC control drive) using exclusively fibre optics for real-time communication among all units.

The machine is available in "S" and "R" versions: the first makes it possible to economise on the purchase price, while the second is more lavishly equipped. Farina Marco has chosen the more competitively priced model, impressed by its price/performance ratio. “The better-equipped version would have been a size too big for us and our practical experience has confirmed this. We also checked the offers of rival manufacturers and, after a direct comparison of products in the same category, we can confirm that the MV2400S stands out with its superior performance in terms of speed, precision and other useful functions. What ultimately clinched the decision was the machine’s availability from the supplier Overmach – the machine was in our shop in only three days. As a side-line, this has enabled us to solve numerous problems caused by an increase in workload. In addition to the advantage of a broad selection of machines at its branch, Overmach eliminated all the red tape in supplying the machine. It’s true that we already knew each other, but they placed so much trust in us, and we really appreciated it.”

In the Farina Marco workshop, the Mitsubishi Electric MV2400S is used for the production of punches and dies for deburring tools.

Overmach Group with its headquarters in in Parma, Italy, offers the metalworking sector a broad array of lines and machine tools from big-name international manufacturers, intended for toolmaking as well as for general mechanical engineering.

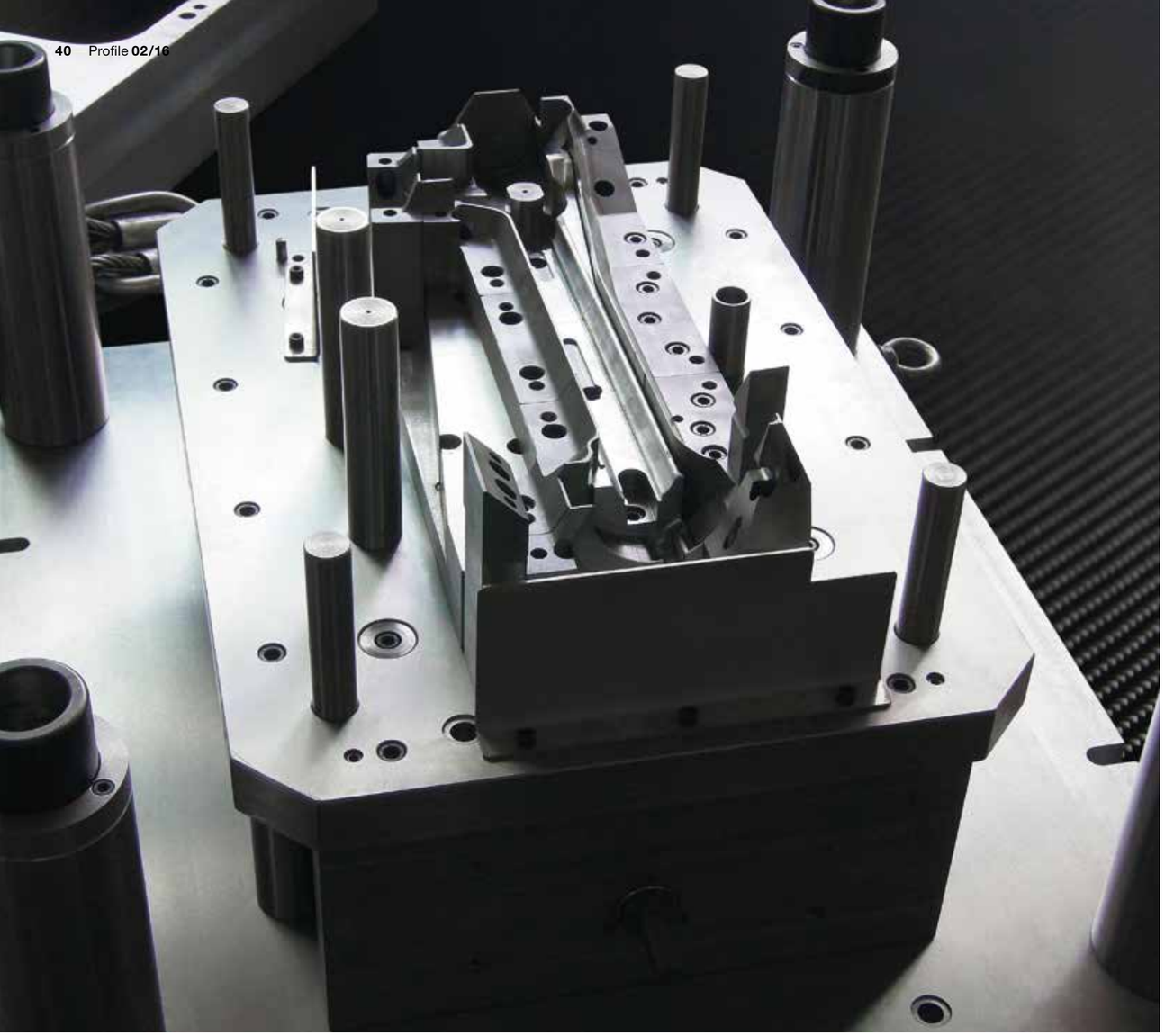
Impressive performance

The Mitsubishi Electric MV2400S features simple and intuitive operation. The installed CAM system is conspicuous with its progressive user interface and is capable of directly importing and managing 3D data without supervision. Because of the exceptional complexity of the equipment it builds, Farina Marco nevertheless uses an external CAM system. The use of Tubular Shaft Motors instead of rotary motors and the lack of friction facilitate extraordinary sensitivity. “We have found the machine to display excellent precision both during machining and with its stop function. In the event of the tiniest resistance, the machine

Cristian Farina, Sales Manager of the business in Cantù, (right) and Luca Somaschini (left)

Farina Marco

Design and production of elaborate and complex tools.



comes to a halt so as to protect the workpiece and the machine itself from harm. Also worth mentioning is the high speed of the rapid motions: even if we only gain ten minutes per day, the time savings in the course of a year can really add up."

Major progress has also been made with the automatic threader. Up to a height of 180 mm the Intelligent AT system is capable of rethreading straight into the kerf at the point of wire breakage. It facilitates not only optimisation of thread recovery but also better performance in the annealing and straightening of the wire. "We are aware that other machine manufacturers offer similar systems, but Mitsubishi Electric technology is truly fast and effective. The automatic water level control in the tank is also very important for us, because this way we can set up several workpieces at the same time, all with different heights, without the water level having

Mitsubishi Electric technology is truly fast and effective.

to be constantly re-adjusted for each one. This means that each workpiece has the optimum parameters, and the much extended machine autonomy enables us to run unmanned shifts at night and on public holidays with a considerable boost to productivity." The technicians at Farina Marco have also been impressed by the machine's autonomous filter configuration: the Long Life System integrated in the machines has extended its service life yet again – with the associated reduction in outlay on replacement parts. Power consumption and wire usage have also gone down.

Standing its ground

Today it is becoming more and more essential to specialise in complex processes – and this applies all the more to the many small businesses in Italy. Many of them are not only taking up the challenge, but are also seeking to "speak with their own voice" and appeal to customers with their own special skills that are appreciated on the international market. The experience of Farina Marco is an example of this: "We build highly complex and elaborate tools that not everyone is capable of designing and making. In addition, there is no end to innovation. Today, for example, we are noting an increasing use of magnesium, a metal with incredible properties, but which calls for special attention during punching. Barrel-polishing is out of the question, and so we have had to come up with other solutions. We supply our tools in all cases fully equipped with electrical, hydraulic and pneumatic connection points, fully wired and ready to be set up next to the press that it's supposed to communicate with."

The business in Lombardy carries out both sampling and fine-tuning in its own workshop, although, if the customer needs assistance with commissioning, Farina Marco also offers an on-site set-up service. Even if the deburring tool segment really is a niche market, the company is experiencing a major expansion of business both in terms of its customer base and the number of systems in the pipeline and already under construction. Farina Marco's sales have been constantly rising for years and the possibility of extending the workshop is already on the horizon.

www.farinamarco.com

Farina Marco

Outstanding precision with the machining and stop function.

Built in
1974

190
training rooms

Information, advice and support, and especially initial and further training

The Training Centre of Upper Austria's Chamber of Industry promotes the regional economy and industry with hands-on initial and further training in all craft, service and industrial trades.

WIFI OÖ GmbH

Knowledge is forever.

Hands-on initial and further training.

In Linz in Austria, the Business Development Institute (WIFI) of Upper Austria's Chamber of Industry runs a regional centre for initial and further vocational training. It is here that basic technical and commercial training is available in all craft, service and industrial trades. Skilled staff can also obtain further training here, e.g. to become master craftsmen. The training of skilled EDM staff on modern machines was also launched there a few months ago.

The region around Linz in Upper Austria ranks as one of the foremost industrial centres of the Alpine republic. Alongside globally renowned and important large enterprises, e.g. steel mills, there is an abundance of small and medium-size businesses here, including jobshops as well as tool- and mouldmakers. In Austria, too, these firms are aware of the looming shortage of well-trained and qualified specialised staff. To counteract this, the Training Centre in Linz supports the regional economy and industry with a broad spectrum of training and courses. Erich Döberl, Director of the Metalworking and CNC Technology Department, reports: "Initial and further training in industrial trades is an immensely

A broad range of training and courses.

important economic factor and encourages the ongoing development of the industrial region around Linz. With our range of training opportunities, we play a key role in laying the foundations for the region's future."

Overall, some 80,000 people make use of the varied offering of courses of WIFI in Linz and are trained by 2,200 instructors in all craft, service and industrial trades. This makes this initial and further training centre about twice the size of comparable institutions in other cities and regions of Austria.

Training in advanced CNC technology

As Döberl explains further, some 1200 apprentices attend courses of basic training in a broad variety of metalworking trades each year. Over 80 examiners serve these young people on their way to their final exams. In addition, about 350 lathe and milling machine operators take advantage each year of industry-wide training to update and build on their knowledge and skills. Furthermore, over 400 apprentices and 200 skilled hands from industry are given special training in CNC technology. More recently, there has been a drive to interest women in technical professions and in the associated training. Offering attractive courses for women, the Training Centre in Linz introduces them among other things to CAD/CAM and CNC programming. Döberl explains: "Our curriculum is targeted at both young people and mature individuals who wish to obtain vocational qualifications. Our training is geared to the field, and the knowledge and skills acquired by course participants enable them to go straight into production in craft and industrial businesses. With our drive to offer women further training in technical professions, we are also actively engaged in mitigating the shortage of skilled staff."

Angel Muñoz, Regional Sales Manager EDM of Mitsubishi Electric Europe; and Erich Döberl, Director of the Metalworking and CNC Technology Department at WIFI in Linz, see the benefit of investment in modern EDM technology in improving the skills of specialist employees of tool- and mouldmaking businesses. This investment also supports Mitsubishi Electric's regional sales activities.

Demand for specialists in tool- and mouldmaking

Numerous tool- and mouldmaking businesses are concentrated within a radius of some 200 km from Linz and these are dependent on highly skilled staff. Only with them can they meet today's standards of quality and flexibility. As Döberl has repeatedly learned from these firms, there is big demand for well-trained staff. This applies not only to specialists in turning, milling and grinding, but also experts in wire cutting and die sinking. The last-named technologies are indispensable in tool- and mouldmaking, although they are considered more of a technological niche than conventional machining methods. Even in the usual training of tool- and mouldmakers, this technology is only covered as a side-line, so there is special demand for regular further training in die sinking and wire cutting on current machines and equipment.

Detlef M. Büll, Managing Director of dealer Büll & Strunz and regional representative for Mitsubishi Electric in Austria.

To satisfy regional demand for training, the specialists at WIFI's Training Centre in Linz invested a few months ago in an EA8S die-sinking machine and an MV1200R wire-cutting machine. Notwithstanding its compact design, the EA8S is a fully equipped unit and comes with an automatic tool changer and a C-axis with an attachment for Erowa pallets. With the current Advance Control, it offers all the prerequisites for sound basic training in die sinking. The MV1200R wire-cutting machine is equipped with the optional fine-finishing generator to achieve surface quality within the Ra 0.1 µm range. It is thus capable of producing high-grade components that meet industry's practical requirements.

For initial and further training, two external trainers are available, both of them employed as skilled staff in tool- and mouldmaking. This means that the course has a strong practical basis in the long term. As Döberl explains, course participants can benefit from this as well as actual and potential customers in the region. "With the machines from Mitsubishi Electric, trainers at WIFI can practically communicate the special advantages of current EDM technology and its benefits for manufacturing businesses," he adds.

Dual benefits

Mitsubishi Electric's regional agent in Austria profits additionally from cooperation with WIFI. Detlef Büll

By investing in the EA8S die-sinking machine and the MV1200R wire-cutting machine from Mitsubishi Electric, WIFI in Linz is excellently equipped for the sound basic and advanced training of skilled staff in industry.

Erich Döberl, Director of the Metalworking and CNC Technology Department: “At the Training Centre in Linz we provide basic courses and advanced training in current production technologies for skilled staff in the metalworking sector.” “Practical training on modern die-sinking and wire-cutting machines from Mitsubishi Electric goes a long way towards enabling regional tool- and mouldmaking in one of Austria’s leading industrial regions to stay competitive.”

reports: “We can use the EA8S die-sinking machine and the MV1200R wire-cutting machine at WIFI in Linz for demonstrations and test machinings. For our customers in this important industrial region, this means they don’t have to travel far. This makes us flexible in addition, so that we can respond at short notice to inquiries and requests.” Büll is the Managing Director of Büll & Strunz Ges. m. b. H., Wiener Neudorf, a trading company that has been acting as the regional agent for Mitsubishi Electric in Austria since April 2016. In cooperation with WIFI, the specialists of Büll & Strunz also organise after-sales service for Mitsubishi Electric EDM machines for customers in Linz and environs.

Döberl and Büll are unanimous in their conviction that the purchase of EDMs from Mitsubishi Electric has paid off in every respect. In their view, it can serve as a model for similar cooperation with institutions for initial and further vocational training elsewhere.

www.wifi-ooe.at

Profile

- 2,200 external trainers – 80,000 course participants per year
- In the metalworking trades, courses for 1200 apprenticeships and 200 further training and retraining participants
- Initial and further training in craft, service and industrial trades for the industrial region of Upper Austria around Linz
- In keeping with its standing in the region, the WIFI Training Centre has almost twice the capacity of similar institutions elsewhere in Austria.

Company profile

WIFI OÖ GmbH

WIFI OÖ GmbH
Wirtschaftsförderungsinstitut der Wirtschaftskammer Österreich
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Fax +43 05 7000-7609
kundenservice@wifi-ooe.at
www.wifi-ooe.at

Managing Director
Mag. Harald Wolfslehner

Core business
Information, advice and support, and especially initial and further training (4228 training places)

Training rooms
190 rooms (including: 21 computer rooms, 72 workshops)

Built in
1966
Extended in
1985, 2001, 2010

A strong practical basis in the long term.

Founded in **1948**

25 employees

Production of complex, spring-hardened punched and bent parts as well as products with matt-finish punched edges or punched parts meeting special requirements

Honex AG

Remote machine access

opens up new opportunities.

With innovative technologies and a modern machine park, the two managers of Honex AG, Reto Christen and Edgar Blöchlinger, are keeping the company on track for success. Relaxed, with a cup of coffee in one hand and an intricate punched part in the other, Christen explains the philosophy of the specialists in punched and bent parts. For him, punching is more than simply perforating sheet metal. “With our machines,” he says, “we can conjure up contours, shape sheet metal, modify surfaces and fully machine sheet metal.” The punching and bending methods are very quick and efficient, offering vast scope for the processing of sheet.

With its 25-strong workforce, Honex AG in Switzerland hasn’t committed itself to the mass production of series running into the millions. As a service provider in a high-price country with the associated wage levels and social standards, it has placed its focus on challenging punched and bent products. “We concentrate on products that call for a certain expertise, a high standard of production quality and exceptional precision,” Christen explains. These include complex, spring-hardened punched and bent parts as well as products with matt-finish punched edges or punched parts meeting special standards of accuracy and material hardness such as sheet metal of 100 % fine blanking quality.

Products with smooth edges

“We’ve developed a process for highly efficiently producing blanks with nothing but smooth edges, i.e. entirely without fractures,” the manager adds. Such edges are usually the preserve of fine blanking. The Honex method produces smooth edges that do not require any further working, which yields considerable cost advantages for the customer. This technology is much appreciated by the textile industry that requires particularly smooth edges.

An important customer from this sector is a Swiss sewing machine specialist. For cost reasons, the company transferred parts of its production to Thailand a few years ago. But because of quality issues, the company brought the manufacture of core products back to Switzerland. For several years now, Honex has been producing parts meeting very high standards of quality and accuracy for the sewing machine manufacturer. These include a yarn brake satisfying levelness requirements of two hundreds of a millimetre over the entire surface.

Blanking and assembling

Subassemblies for the electrical industry have so far been mainly produced with conventional cutting techniques. Parts are blanked and bent and then joined

Jonas Maier (left) and Reto Christen know that customers want precision components.

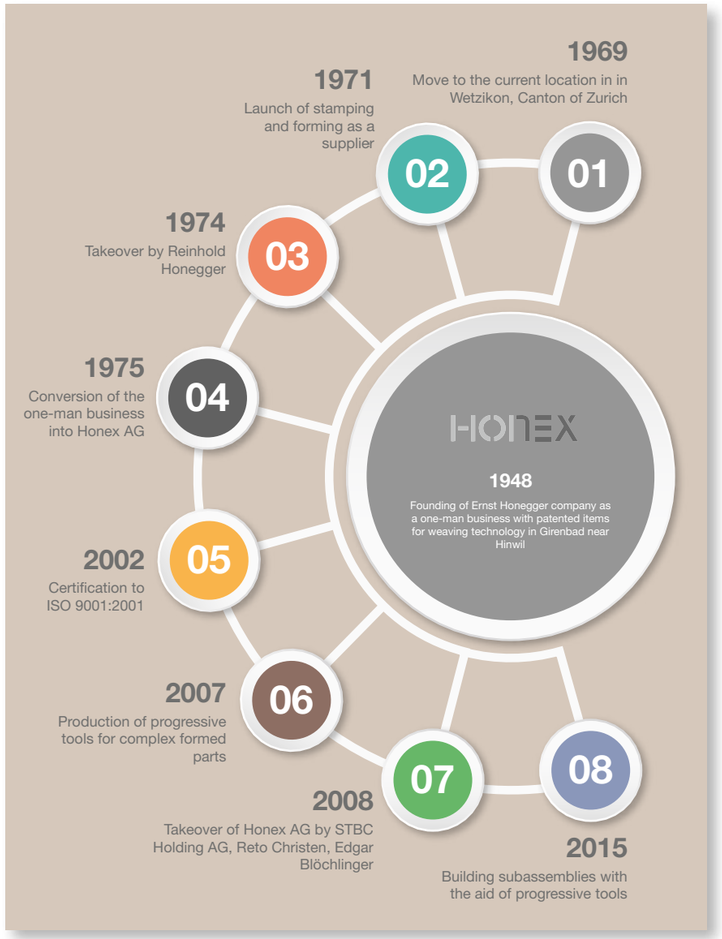
Focus on challenging punched and bent products.

together by machine or by hand. “With our innovative method,” Christen explains, “we are able to feed different materials to our machines on three conveyor belts, process them with progressive tools and finally join them together into single units. This is how we produce clamping rings, for example, for the electrical industry.” Thanks to its innovative technologies, Honex is evolving from a company for punching and bending into a specialist in complex formed parts and subassemblies meeting high standards of function and dimensional accuracy. Christen sees materials that many companies avoid first and foremost as a challenge. Getting extra-hard and in some cases thick materials into shape arouses his sense of ambition. “We’ve built up a lot of expertise in this field and really get going when others have already given up.”

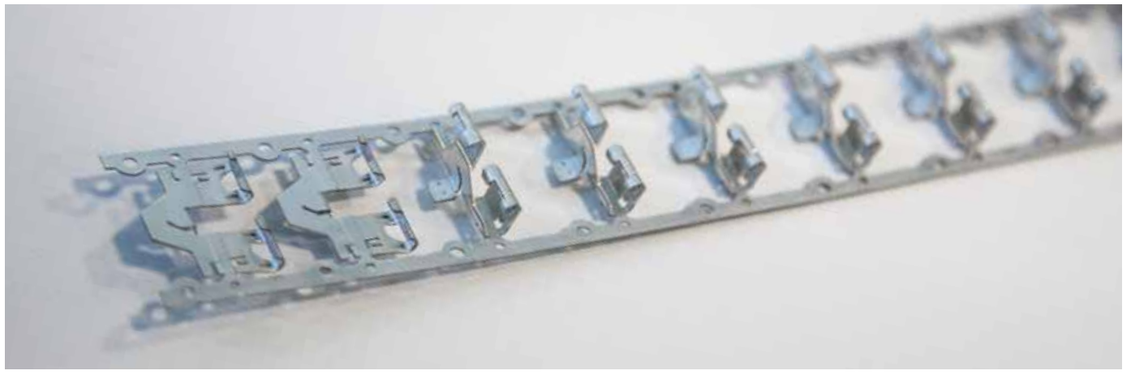
Precision starts with the tools

To meet the high expectations of quality, Honex produces all its punching tools in-house. Its toolmaking department is not particularly large, but it is manned by skilled specialists who are fully conversant with the entire

Chronicle of Honex AG



Complex formed parts meeting high standards of accuracy are a hallmark of Honex.



Jonas Maier appreciates the benefits of the Mitsubishi Electric MV2400R.

production process. “Usually customers come to us with clearly defined tasks,” says Christen. “Honex is involved in product design at an early stage so that the production process for the parts can be optimised when it is a question, for instance, of joining two parts into one. Our development, toolmaking and production activities are closely dovetailed and integrated in planning early on so that all our experience is brought to bear. This is hugely beneficial.” The Swiss specialist attaches great importance to a modern machine park so that it can always offer its customers the best-possible quality and efficient production. A new wire-cutting machine was therefore on the investment agenda at the beginning of 2016. As with all newly purchased equipment, Honex launched a precise market analysis. It didn’t surprise the business owner that the closely

> “With our machines we can conjure up contours, shape sheet metal, modify surfaces and fully machine sheet metal.”
>
> ***Reto Christen***
> Business Manager
> Honex AG

A specialist thanks to innovative technologies.

Honex stands for innovation in punching.

examined machines were all highly efficient and differed relatively little in terms of precision and cutting speed. “But there are a number of definite advantages,” Christen reports, “that made their impression on us and swayed us in favour of a Mitsubishi Electric MV2400R.” Mitsubishi Electric scored above all with its new CoreHold function and the opportunities for remote machine access.

Fully remote access to the wire EDM system

Being able to access an EDM system from remote desktop or tablet computers or smartphones and reading off the operating status or fault messages is almost standard today. “But having full access to the machine,” Christen continues, “is new and a real advantage that pays off.” The goal of all businesses is to make optimum use of their machines – best of all around the clock. During the week, the employees’ working hours dictate the usage of machines that run for eight hours during a shift. If possible, long-running jobs are clamped on the machine for the night hours and weekends, always in the hope that everything goes smoothly and no hitches occur. This is usually the case, but not always. It’s the little things that cause stoppages every now and then.

The new Mitsubishi Electric software offering almost unrestricted access to the machine from anywhere supports Honex’s system of flexible working hours.

Flexible working hours

In a company with modest toolmaking activities and fixed working hours, employees are not constantly busy. “The idea for a new hours schedule came in good measure from the employees themselves. In consultation with them years back, we arrived at a flexible arrangement from which both sides benefit. It takes equal account of the interests of staff and of the company. A genuine win-win situation with greater responsibility and scope for decision-making.” In addition to a core period in which they are required to be at work, employees can now organise their duties and times of their own accord. They plan their work within the given time frame. The arrangement also entails that employees in certain cases have to bring their wishes into line with current workload. In the event of urgent jobs, it also envisages working into the late evening and at weekends.

Remote fault remediation

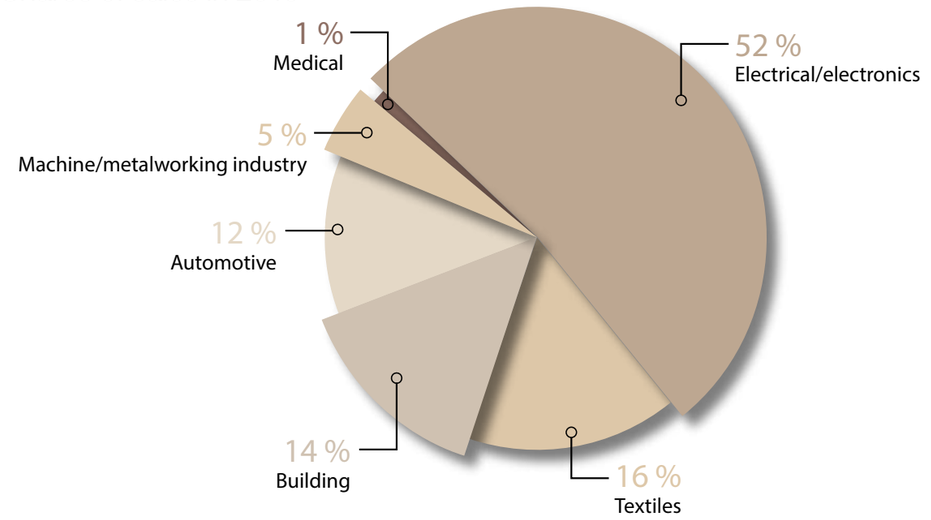
On the MV2400R the employee can see on his iPad which fault has occurred and intervene directly into the machine control and bring the machine to the next step. If, for instance, a problem crops up when machining a hole, the toolmaker is informed and can issue the necessary commands from his iPad, e.g. “Go to the next step”. “The machines competing with the Mitsubishi Electric MV2400R that we compared didn’t have this function,” says Christen. “Using this software means that at weekends we only have to be present on site to check up on things in emergencies – a real bonus for us.”

Long-running jobs with multiple openings

Plate from which many shapes have to be cut out used to require the toolmaker’s presence for several hours. The shape had to be cut out of the workpiece to leave a small web. The toolmaker then pressed out the web and removed the metal part from the dielectric. “On the new Mitsubishi Electric MV2400R, we can process such items as long-running jobs overnight or at the weekend without having to manually intervene,” says a gratified Christen. The CoreHold technology makes this possible.

At the roughing stage, the EDM system separates the part from the scrap but after cutting joins the two parts back together with one or more tiny dot welds. The scrap parts can then be removed from the workpiece

Shares of sales in 2015



Almost unrestricted access to the machine from anywhere.

Interview

Reto Christen
Business Manager
Technology/Sales

I need ...
... a good network of personal contacts.

I can do without ...
... luxury.

I'm dependent on ...
... a good network of personal contacts.

I lied when I ...
... I can't think of any instances of bending the truth – sometimes I omit something, but lying really isn't my thing.

I could cry when ...
... I achieve a goal that I've been working towards for a long time. That's always a very emotional moment for me.

I get really angry about ...
... injustice.

I'm happy with ...
... the people around me.

My biggest environmental sin is ...
... my motorbike's petrol consumption.

and collected. "A work process that is completed in a matter of minutes," Christen explains. After this, the machining program resumes. On long-running jobs with multiple openings, this shortens machine-running time considerably. So the purchase of the Mitsubishi Electric MV2400R has not only optimised the process and yielded cost reductions, but has also revolutionised working hour arrangements at Honex.

www.honex.ch

Company profile

Honex AG

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Managing Director
Edgar Blöchlinger
Reto Christen

Core business
Production of complex, spring-hardened punched and bent parts as well as products with matt-finish punched edges or punched parts meeting special requirements

Employees
25

Founded in
1948

Slashing machine running time.

There's no doubt about it: thick-coated Japanese macaques are extremely inquisitive and alert animals. They find interest in almost any object in their surroundings, investigating it and possibly even tasting it as well.

Japan Special

The Japanese macaque –

a lively climber with a lively mind.

The latter, of course, does not apply to such a huge device as a machine tool. After all, not even the most inquisitive monkey would be able to bite into it. But you could be pretty sure it would try. Nevertheless, the macaques from the "Land of the Rising Sun" always have plenty to keep themselves occupied. Their natural habitat on Japan's three southernmost main islands of Honshu, Shikoku and Kyushu offers the snow monkeys or red-faced macaques ample space to run around and lots of excitement. A number of cheeky individuals or even whole troops sometimes venture into cities. On the other hand, they are pretty unwanted visitors to the fields of Nippon's farmers, as the agile tree- and ground-dwellers

Macaques in the Land of the Rising Sun.

often cause serious damage there. It is therefore no surprise that macaques are unwelcome as harvest helpers: after clearing a field in next to no time, the thieving band vanishes with bulging cheeks and bellies, never to return.

Yet the species looks so harmless. With its red face and similarly pinkish hindquarters, the Japanese macaque is an amusing sight. Groups of these animals, 14 on average, are therefore a much-loved spectacle when they show off their acrobatic prowess on and above the ground.

A young macaque, still without its red face

This species of monkey, renowned for its pronounced social behaviour, is very popular in zoos. Children are often quick to spot the initially brown-coloured offspring carried lovingly by their mothers through the enclosure, first clinging to the belly and a month later moving up a storey onto mum's back.

Most members of this species feel happiest in the company of their fellows, even as adults. "All for one, and one for all" is one way of describing the credo of these creatures, who are well-protected from the cold by their grey fur. Some members of the group withdraw from the others occasionally – to have a nap, for example. But Japanese macaques feel most at ease with the whole tribe romping around them. Here again, there is an exception to the rule: males leave their native group on reaching sexual maturity, either joining another group or at first keeping to themselves, as "lone wolves". For the mature males among the red-faced macaques, it is also total normal to switch group allegiance from time to time.

The females behave entirely differently: they stay true to their family of origin all their lives. And they even eventually form the nucleus of this group, as snow monkeys live in a kind of matriarchy. As a result of this female power system, these members of the Japanese animal kingdom cam be said to lead more emancipated lives than their female counterparts in many human societies. On average, each female spends only 1.6 days with a male, with whom she rests and eats together, and mates. Then she soon feels the need to move on, and the couple separates. Footloose and fancy-free, these monkey females!

Another thing worth mentioning is that these creatures are anything but stupid. When it comes to their ability to grasp new things, snow monkeys are among the best. Some – in most cases the leaders – even show genuine ambition. In general, the expert climbers are eager to copy tricks from their fellow group members, whether in the wild or in a zoo enclosure. Back in 1979, for instance, zoologists observed a female macaque playing with pebbles, piling them one on top of the other like a child playing with building blocks. A few years later, half of the group could be seen passing the time with this previously unknown activity. Another female monkey worked out for itself that sweet potatoes taste better when they're washed before consumption. So she scampered to the river with her harvest and scrubbed the sand off – and this was a behaviour that soon found avid emulators among other members of her family. The red-faced macaques have thus clearly demonstrated their learning abilities, very much to the satisfaction of zoologists!

Along with sweet potatoes, a huge variety of foods ends up in the hands and mouths of snow monkeys in the course of a year. Fortunately, they are not particularly choosy and will take pretty well anything made available by their natural surroundings. They have a special preference for fruit, although their mainly vegetarian diet also includes herbs, nuts, seeds, leaves and fungi. Occasionally insects and small fish can be found on the menu, however. Members of this species living in the northern reaches of its island habitat even feed partly on tree bark. Here again, intelligent Japanese macaques tend to err on the side of caution, putting on a layer of fat during the warmer months so that they can survive periods of food scarcity in winter.

Letting off steam – a group of snow monkeys enjoying the hot springs in volcano-rich Japan

Agile tree- and ground-dwellers.

Founded in **1921**

>129,000 employees

Manufacture of electronic equipment, e.g. EDM systems, laser cutting machines, CNC controls and drives, industrial robots, air conditioners, semiconductor technology and much more besides.

Mitsubishi Electric

Crash Protection System.

Easily installed.

A considered and far-sighted approach is the best safety policy – but what if things have to be done in a rush? An intelligent EDM system that spots and prevents possible collisions contributes to safety at work and saves annoyance and time.

The wire EDM systems from Mitsubishi Electric constantly check the axial forces and thus automatically detect accidents before they happen. If there is an obstacle in the travel path, this is identified in a gentle approach, and the control automatically reverses. This works so well that in tests a glass remained intact – see for yourself in this short film (www.mitsubishi-edm.de/cps-en) how it works in practice.

The Crash Protection System from Mitsubishi Electric works whether you machine manually or with the aid of a cutting program. This way you can wire-cut from now on with something of an in-built “guardian angel” and enjoy an even stronger sense of security.

The guardian angel intervenes.

www.mitsubishi-edm.de

EDM GOES MOVIE!

See for yourself and watch the dependable Crash Protection System from Mitsubishi Electric in action!

Scan the code now and watch the film.

www.mitsubishi-edm.de/cps-en

Mitsubishi Electric

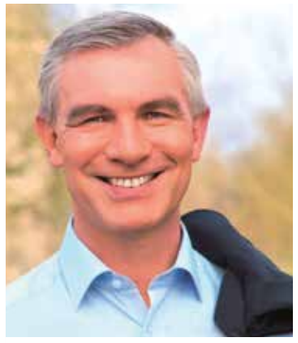
The in-built “guardian angel” from Mitsubishi Electric.

Mitsubishi Electric

changes.AWARD –
changing the world for good!

Die Freunde und Förderer des Industriemuseums Cromford e.V. (association of friends and sponsors of Cromford Museum of Industry) and Mitsubishi Electric have organised a pupil competition for classes 11 and 12. And not one but two groups of winners will be travelling to Cape Canaveral in Florida. The runners-up will visit the CERN particle accelerator in Geneva and the third-placed team of pupils will be going to a technology location in Berlin.

Under the patronage of Garrelt Duin, Minister of Economics, Energy, Industry, SMEs and Crafts of the Land of North-Rhine/Westphalia, a total of 11 teams from 5 schools competed for the coveted changes.AWARD. The theme of the 2016 changes.AWARD is the design of an innovative product, idea or solution in the communication field. The starter's gun for the changes.AWARD was fired on 31 December 2015. In the context of the project, the pupil teams had among other things the chance to attend the official kick-off event at the end of January and the optional financial check at the Ratingen branch of Volksbank Düsseldorf Neuss e.G. The personal coaches were available to their groups throughout the project.



"The changes.AWARD shows how much potential our school pupils have. With their many forward-looking and innovative ideas, the participants have made the changes.AWARD a unique platform for creative young people in our region."

Klaus Pesch
Mayor of the Municipality of Ratingen

The final of the changes.AWARD took place on 1 June 2016 at Mitsubishi Electric's new German branch. This is where the 11 pupil teams presented their project ideas on the basis of business plans. In the preceding weeks they had worked on their project ideas under the guidance of their teachers and personal coaches and completed them by 23 May 2016.

The victory ceremony took place on 19 June at this year's Cromford Park Festival.

The business plans were presented to a high-calibre jury from Ratingen:
- Gerd Droste, Freunde und Förderer des Industriemuseums Cromford e.V.
- Georg Jennen, Mitsubishi Electric Europe B.V.
- Norbert Kleeberg, Rheinische Post
- Wolfgang Küppers, Freunde und Förderer des Industriemuseums Cromford e.V.
- Tanja Niesen, Volksbank Düsseldorf Neuss e.G. Filiale Ratingen
- Alexander Rebs, REBS Zentralschmiertechnik GmbH
- Erhard Schäfer, Coronex Electronic GmbH
- André Tünkers, Tünkers Maschinenbau GmbH

The best project ideas were selected by means of a neutral points system.

Two groups win the first prize
The Kopernikus-Gymnasium secondary school impressed the jury with its "Guardian", an alarm system integrated in a piece of jewellery which is capable of saving the lives of the elderly in particular. A team of pupils from the Theodor-Fliedner-Gymnasium secondary school in Düsseldorf-Kaiserswerth made its impression with its "Savie", a device capable of issuing alarms with the aid of a sensor.

> We are impressed by the creativity and professionalism of the submitted strategies and wish to express our many thanks for the lively participation in the changes.AWARD. All the projects offer exciting and innovative insights into possible communication worlds of the future from the point of view of today's youth – for "in the beginning was the idea".
>
> ***Georg Jennen***
> General Manager at Mitsubishi Electric

This innovation is of special benefit to equestrians, as it is capable of saving lives in the event of a fall. The jury decided unanimously to commend two winning teams, because both projects were outstanding in the same area – that of actively saving lives. The ideas of the two winners also complement one another outstandingly and could even be combined under certain circumstances. The winning teams have not only won a trip to Cape Canaveral but also a four-week stint of practical work experience at Mitsubishi Electric. Congratulations to them!

Second place went to Adam-Cüppers-Berufskolleg vocational training school for its innovative idea of making a video tutorial for assembling flat-pack furniture available on a website accessed via a code and will be travelling to Geneva to the CERN particle accelerator. The second team of the Kopernikus-Gymnasium won the third prize, a trip to Berlin to a technology location, for its M.A.S.K. concept. This idea enables firemen to read life-saving information on the visors of their helmets when on an assignment.

www.mitsubishi-edm.de

The changes.AWARD film.

You'd like to know more about the changes.AWARD?
If so, scan the code now and find out in the film!

www.changes-award.de

The victorious teams also win practical training at Mitsubishi Electric.

User horoscope.

Capricorn
21 December–20 January

On the road you make a profound impression on other motorists, catching them off their guard by driving the wrong way. At work, your EA-S luckily does without a dachshund with a bobbing head. Maybe it's better to give yourself a timeout and take your foot off the accelerator – after all, your car unfortunately doesn't have your EDM's Crash Protection System.

Aquarius
21 January–19 February

The present constellation of the stars activates your feel for Feng Shui. Now is the time to throw out all the junk you've been lugging around with you for years. You yield to the urge for space and fresh air in your production shop. Mercury grants you unexpected muscle enabling you to shift your EDM system from one corner into the other.

Pisces
20 February–20 March

In the current Jupiter month, your travel distances have become a little longer again. At this time you're particularly sensitive to wire-cutting trends that beckon welcomingly from the future. Seize this opportunity! Mitsubishi Electric's freshly revamped EDM Shop awaits you in the spheres of the World Wide Web and is bound to have a positive effect on your root chakra.

Cancer
22 June–22 July

The sparkling dielectric of your EDM system reminds you of your last summer holiday at the seaside. But beware! Diving into the tank from the side is just as forbidden as at the swimming pool! Instead, encourage your boss to organise a company outing to the Caribbean. This is at any rate simpler than tailoring a matching Baywatch outfit for your fellow shift workers.

Leo
23 July–23 August

Your production curve is currently at the bottom end of the scale. You should of course do something about this. New inspiration may come your way and you additionally sense your die-sinking machine's yearning for fresh consumables – why not be generous for a change? But be careful – your partner is growing envious. A little gift can make all the difference.

Virgo
24 August–23 September

You're at your wits' end – your company network has crashed! You rush to your IT specialist and the heel of your shoe snaps off. No wonder you go through the roof! But the new moon brings clarity: investigate problems in a playful way and solutions will reveal themselves. And you'll get on with your IT system almost as well as with the NC programs of your MV-S.

Aries
21 March–20 April

As a high-productivity professional wire-cutter, you're more successful than ever. You manage even the most complicated cuts in the taper angle. What's more, you're significantly faster as well, which gives you time to watch your resentful workmates at work. So just call to mind the saying, "Envy is the sincerest form of flattery."

Taurus
21 April–21 May

As the temperatures drop, the nights get longer. No doubt about it: your partner needs more of your presence and attention. Fortunately, your dependable MV-R runs unmanned overnight so you can concentrate entirely on your better half during the night hours. On the following days, you come back to work bright and cheerful.

Gemini
22 May–21 June

Watch out, the new moon is taking effect! Even your style of dress is becoming eccentric and eye-catching: you mix colours and patterns that don't seem to match. Luckily the fine-finishing generator and 3D position detector of your trusty machine prevent your customers from being as disconcerted as the looks of your friends and relatives.

Libra
24 September–23 October

Mercury with its directness is governing your life in the coming weeks – but unfortunately not as precisely as the CNC control of your wire-cutting machine. All the same, you cut your punches much better than the competition who for their part are battling with the turbulent effects of their Saturn and Neptune quadrants. This is your chance!

Scorpio
24 October–22 November

You run your machine park like the conductor of an orchestra. You organise your production line so perfectly that even your workmates at reception start to sway in the rhythm of your generators. Are you about to cut into a career as a composer? At any rate, the feedback from satisfied customers is music to the ears of your otherwise unmusical boss.

Sagittarius
23 November–21 December

Watch out for colds in winter – and watch what you eat! Not everyone is nurtured as well as the EA-V die-sinking machine by its fully automatic central lubrication system. So don't risk stoppages and ensure a constant supply of vitamin-rich fruit and herbal tea – entirely without lubrication nipples or cumbersome grease guns.

The CNC program of the stars – decoded at last.