

The Art of *Economy*



The Art of *Economy*



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eco-friendly production,
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Where there's a will,
there's a way.
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Mitsubishi Electric Europe B.V.
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Mechatronics Machinery
Gothaer Strasse 8
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Tel +49 (0) 2102 486-6120
Fax +49 (0) 2102 486-7090
edm.sales@meg.mee.com
www.mitsubishi-edm.de

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

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Exciting reports from the world of wire EDM.

Hans-Jürgen Pelzers



“We haven’t inherited this earth from our parents, but have only borrowed it from our children.”

Konrad Lorenz
(Nobel laureate)

Green production is not only a buzzword, but also a conscious decision to curb wastage. You can read in detail about the alarming trends on the resource front on page 12.

However, sustainability means not only throttling consumption, but also making one’s own company more competitive. Shorter machining times make the company more flexible, while lower power consumption directly benefits your bank account. Using less wire reduces warehousing, shipment and procurement costs simultaneously and in the long term. And if you can additionally perform almost all your jobs with standard wire, you’ve got one more reason to be contented. Re-equipping their lighting with LEDs and low-cost heating with heat pumps are other options that forward-looking entrepreneurs are investigating.

Of course, “sustainability” also means “sustaining” the business – keeping it a going concern, over and above the benefits for the environment.

Maybe you’d like to take a look at the current ideas for 2015 and beyond at this year’s Moulding Expo in Stuttgart at the beginning of May and find out what suits your particular needs best.

Hans-Jürgen Pelzers
from the Technology Centre in Ratingen



Unprecedented sound speed delivers improved loudspeaker performance

Mitsubishi Electric announced today it has developed an advanced technology for manufacturing boron-carbide diaphragms used in hi-fi loudspeakers, applying an optimal diaphragm build-up method to realise the fastest sound speed of any commercially available boron-carbide diaphragm, resulting in improved sound quality. Mitsubishi Electric will apply its new technology in home and automotive acoustic products and audiovisual systems.



New Gladbeck Technology Centre opens

“From the idea to the finished product” is the motto under which KAAST Werkzeugmaschinen GmbH, Mitsubishi Electric Europe B.V., MMC Hartmetall GmbH, Meusburger Georg GmbH & Co KG, SolidCAM GmbH and Coffee GmbH opened the first and only showroom in the Gladbeck region in November last year. “Technologie Zentrum Gladbeck” or Gladbeck Technology Centre covers the entire production process from start to finish.



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Mitsubishi Electric delivers satellite to Qatar

Mitsubishi Electric has been awarded a contract to deliver the Es’hail 2 communications satellite to operator Qatar Satellite Company (Es’hailSat) in Doha. In-orbit delivery is scheduled for the end of 2016. Mitsubishi Electric is the first Japanese satellite manufacturer to enter the Arab commercial communications satellite market. With a more than 15-year design life, the Es’hail 2 satellite will offer direct broadcasting services throughout the Middle East and North Africa of television stations such as Al Jazeera and beIN SPORTS.



Founded in
1991

8
employees

Classical toolmaking and jobbing

In toolmaking, Mirko Trentzsch has always insisted on quality. "As a small firm, we've so far concentrated on the Dresden region and found our customers here," Managing Director Trentzsch is proud to report. Precision, punctual delivery and flexibility are the values that the firm has been successfully espousing for over 20 years. With his advanced machine park and skilled staff, the small business has everything it needs to supply industry with flawless tooling.

Werkzeugbau Trentzsch GmbH

Structural change as a springboard to success.

When Siegfried Hillig laid the foundations for his "Drahterosion Werkzeugbau" firm in Radeburg in 1991, he knew the path he wanted to take and the target groups he wanted to attract. Although general economic conditions for a new company were anything but ideal in view of the collapse of traditional markets, monetary union and the other factors associated with German

reunification, structural change always offers good opportunities for new ventures. As an experienced toolmaker, Hillig knew precisely what counts in toolmaking and what customers expect: quality, reliability and flexibility. With used but precise machines from the state-owned East German enterprise "VEB Elektromat", the business was launched on 9 December 1991. Today,



Werkzeugbau Trentzsch GmbH

Quality, dependability and flexibility.



"With our concept of quality, we've so far satisfied all our customers," Mirko Trentzsch explains.

Hillig no longer operates the machines, but works exclusively as a consultant, having handed over the reins of his business to his grandson Mirko Trentzsch back in 2010. Trentzsch renamed the company "Werkzeugbau Trentzsch GmbH" in 2014. For Trentzsch, toolmaking means much more than the fabrication of precise tools to supplied drawings or data. Milling, grinding and EDM are standard processes in toolmaking that the competition also masters. "We take our customers as they come," Trentzsch stresses. "If someone brings along a sample, he'll get his matching tool just like a customer who comes to us with a detailed drawing of a finished part. And if anyone urgently needs a replacement component, we can machine it within a matter of hours." With the management handover taking place with the family, the company has experienced a huge boost in its development, a fact manifested among other things by investment and recruitment. Trentzsch thus extended his milling capability by purchasing two machines from Hurco, a VMX 1 CNC milling machine



and a VMX 30 Ui 5-axis CNC milling machine; grinding activities with a Kent KGS 63 grinder; and EDM with an FA10-S Advance from Mitsubishi Electric. "The new machines simply needed more space," Trentzsch explains. "Ground-breaking for our new shop in Brockhausstrasse was celebrated in 2013." In the same year, Trentzsch bolstered his EDM department with two new machines from Mitsubishi Electric, an MV2400R and an ED-24 start hole drilling machine.

Individual solutions for customers

"Our business rest on two pillars, classical toolmaking and jobbing," says Managing Director Trentzsch. He attaches special importance to the production of tools from design through to the finished product. This is where Trentzsch can bring his expertise to bear, introduce refinements and control the whole process through to delivery. Customers come with a whole range of different requirements. Some simply bring along their product sample and want to have the tool to match. "Not a problem for us," the expert says. "We advise the customer, measure the sample and settle all the production issues. Then we optimise the design, produce the drawings and get down to machining the tool. So far we've always come up with a good solution, and customers always go away satisfied." Nevertheless, most orders arrive at the firm with a complete drawing of the finished part or as a 3D model. The second pillar is job production. This is where Trentzsch supports his fellow toolmakers with the full complement of CNC machining techniques. The Radeburg firm has acquired skills in the surface grinding of aluminium and



Trentzsch is synonymous with ingenious, precision technology and superlative quality.

stainless steels and knowledge of non-magnetic materials that require a clamping technology of their own. "Working as a team, we always find the matching solution. We're very creative as far as that's concerned," entrepreneur Trentzsch reports. "We've always managed to satisfy our customers. As standard we offer a surface finish of Ra 0.5. We can also supply our customers with finer surfaces, but they require more machining effort."

Swift and competent service

Wire-cut EDM was one of the mainstay machining techniques from the company's founding. "However, the old machines caused us problems every now and then, and the after-sales service didn't meet our needs or expectations. Hotline consultations involved long waits, and the technical solutions didn't always do the job," Trentzsch explains. So when it came to buying a new machine, he was on the lookout for alternatives. The

staff of commercial agents Richter und Hennig drew Trentzsch's attention to the spark erosion machines from Mitsubishi Electric. "We then gave the Mitsubishi Electric EDMs a thorough looking-over, compared them to those of other makes and also scrutinised them in production at fellow toolmakers'," the entrepreneur recalls. The Mitsubishi Electric FA10-S Advance finally filled the bill and made its way to Radeburg in 2009. A good four years later, an MV2400R together with an ED-24 start hole drilling machine, both from Mitsubishi Electric, followed in its wake. "After switching to the FA10, we had to get used to a number of changes and contact Mitsubishi Electric several times. As their system works really well and we got comprehensive support from Mitsubishi Electric, the changeover went pretty smoothly. We're particularly happy with the really swift service," Trentzsch enthuses. "We can solve a lot of problems over the phone, and we've always got



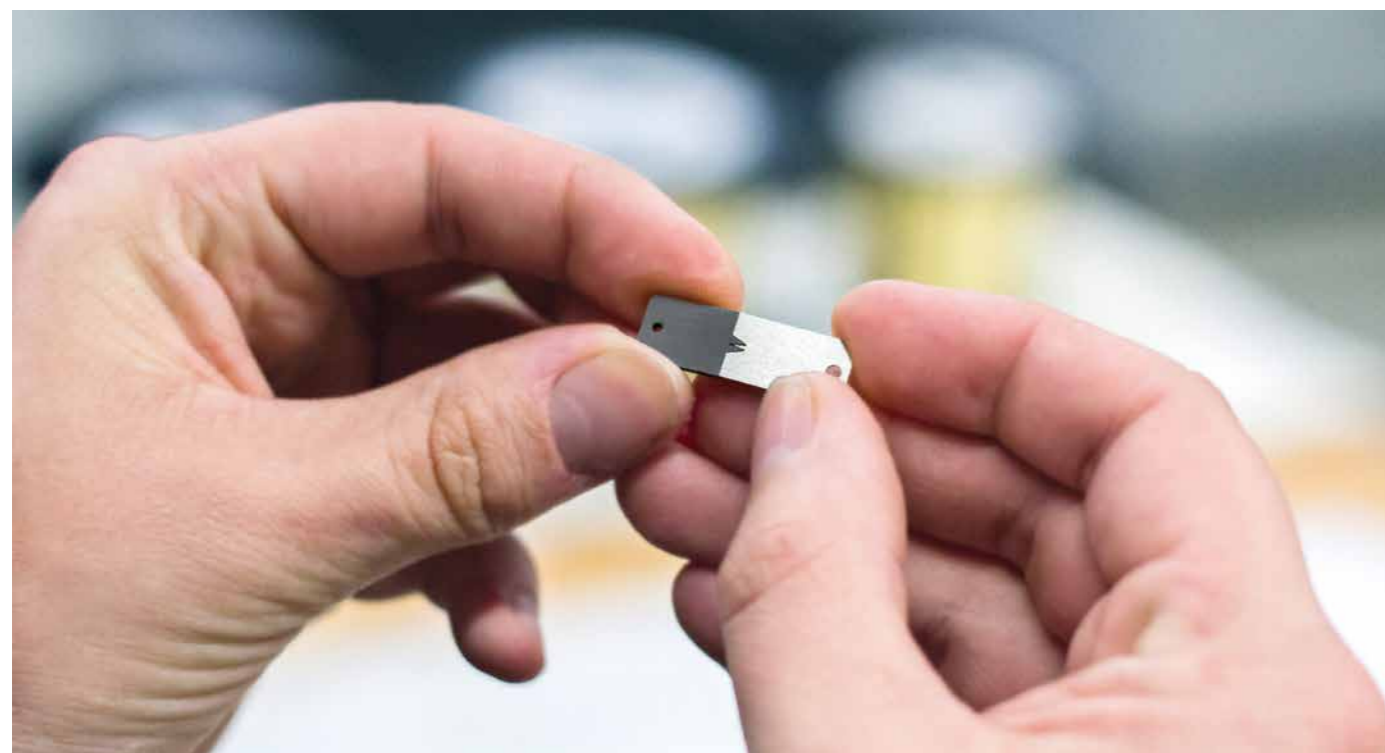
someone competent to talk to. And if the specialist isn't within immediate reach, he calls back as soon as possible and gives us the support we need, even at weekends."

Smooth-running Mitsubishi Electric system

On the strength of experience with the FA10, familiarisation with the system of the new MV2400R was straightforward and fast. On top of this, the new generation of machines came with a number of technological refinements. The MV was quick to impress, as it offers a huge degree of functionality and much faster throughput than the predecessor model, resulting in lower piece costs. Thanks to the new generator technology, energy and wire consumption are noticeably lower. For a modest budget, the new MV Series from Mitsubishi Electric marks the entry point into the high-end class of wire-cutting machines. For Managing Director Trentzsch, the markedly improved quality of cut is also important. Whereas the FA10 called for four cuts to achieve the desired surface quality, the MV takes only three cutting cycles for the same quality – making 25 per cent time savings. A point highly appreciated at the business is wire usage. Compared directly to the FA10, the MV uses

10 to 15 per cent less wire. While the FA10 needed a spool of wire for standard jobs every 30 hours of service, the MV runs for 33 to 35 hours on a single spool. "Our old wire-cutting machines didn't have automatic threading," Trentzsch explains. "The new MV2400R comes with a system that runs automatically and totally without a hitch at night and at weekends. We've already built numerous fixtures so that we can clamp several workpieces for overnight or weekend machining." Trentzsch comes to the following conclusion: "Our experience with Mitsubishi Electric has been thoroughly positive. We're very happy with the service, and because the machines run really efficiently, we can satisfy the market with quality and good value for money."

www.trentzsch-hillig.de



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> 124,000
employees

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e.g. EDM systems, video projectors,
solar power equipment, air conditioning
systems and lifts



Energy and raw materials are becoming more and more expensive. Under these conditions, how can manufacturing industry offer high-grade products without pushing up prices excessively? Automated processes, more efficient production machinery and home-grown power with renewable energy sources offer a solution.

Mitsubishi Electric

Sustainable success:
eco-friendly production, reduced costs.

Manufacturing industry has a problem: because newly industrialised countries like China are growing rapidly and the economy is buoyant in industrialised nations like the USA, raw materials are becoming scarcer. In its current report on the resource

situation in Germany, the German Federal Institute for Geosciences and Natural Resources (BGR) is already issuing a warning of serious bottlenecks in supplies. At the same time, there is a general trend in many European countries towards

rising energy prices. Although imported oil is currently cheap because of the global glut, experts are forecasting an imminent end to ruinous competition among the oil-producing states and a return to rising prices. In Germany, according



Mitsubishi Electric

Home-grown power from renewable energy sources.



to information from the BDEW, Germany's federation of the energy and water industry, industrial enterprises currently pay an average of 14 cents per kilowatt hour, which is about a third more than only five years ago. Manufacturers are hit particularly hard by rising prices. For the production of their moulds, technical parts and tools, they need a lot of energy. They are also dependent on supplies of plastics and metals, resources no longer available in boundless quantities, which are therefore becoming costlier. "The demand for metals like copper, nickel and cobalt is huge," says BGR expert Thomas Kuhn.

The situation in manufacturing is exacerbated further by geopolitical factors. According to a current report by management consultants Deloitte, the Ukraine conflict is dampening companies' business and sales expectations. In the opinion of Deloitte market expert Thomas Döbler, manufacturing industry should therefore gird itself for crisis scenarios. "They should keep their focus not only on grow-

ing markets but also on proactive crisis management and on shoring up the supply chain."

Growing customer needs

While the financial leeway for companies is shrinking, customers are becoming more demanding. Whatever the sector – tool- or mouldmaking, the automotive industry or medical technology – products are becoming increasingly complex. And this necessitates higher machining precision and higher productivity. There is also a trend across industry towards just-in-time delivery. Purchasers only want products delivered to their manufacturing facilities when they are actually needed. This way, they hope to reduce the time spent by the supplied goods in their storage facilities and hence capital tie-up. Component suppliers are therefore having to accustom themselves to shorter delivery times and, under certain circumstances, even expand their own inventories – the squeeze on costs in industry is being gradually being shifted up the value chain. Finally, almost all companies today want to diminish

their carbon footprint in the context of the general drive towards sustainability. Anyone unable to supply goods produced with resource-conserving methods is likely to lose out in the long run. Manufacturing companies are therefore faced with major challenges. How can they master these challenges without compromising on profitability?

The German government is pointing the way forward with its high-tech strategy called "Industrie 4.0", a project that is to be largely energised by the computerisation of manufacturing industry. The goal is the "intelligent factory" featuring adaptability, resource efficiency, ergonomics and the integration of customers and business partners in business- and value-generating processes. The main hope is that these smart factories will keep at bay the price-cutting Chinese competition that has been claiming growing shares of the market in European manufacturing. Car maker Audi therefore wants to be one of the first companies to pilot networked production this coming summer. To make its production in Ingolstadt more efficient, it will monitor all trucks carrying components from suppliers. Much like an air traffic control tower, Audi

The key lies in resource-efficient production.



A sustained reduction in the carbon footprint.



Mitsubishi Electric



wants to coordinate truck arrival at its plant. If a vehicle with important goods is delayed, it is directed on arrival straight to the unloading bay instead of having to join the queue, as until now. This way, trucks will spend less time on the plant site – and Audi's expenditure on logistics will fall.

Abundant innovations

There is also cost-cutting potential for small and medium-size manufacturers for whom the digital factory makes little sense. "The key lies in resource-efficient production," says Hartmut Rauen of VDMA, the German Engineering Association. Modern production machines thus save energy because intelligent controls regulate flow rates and consumption, recirculate brake energy and, thanks to new drives, operate with greater precision and speed than the systems established today.

Machines that combine different machining techniques and, ideally, handle the entire machining process are also capable of cutting costs. By using them, companies can slash set-up time and boost their productivity. The latest production technology even integrates recycling. The swarf generated by the machining of metal, for instance, has to be remelted in a high-energy process so that the metal can be returned to the cycle. In a process developed at TU Dortmund University, the chips are compacted straight after machining and pressed into profiles that can channelled straight back into production, thus leapfrogging the expensive melting process.

If companies additionally run their production activities on home-grown energy, they can cut costs further. The massive drop in prices for new photovoltaic installations

is making this possible, and solar energy can now be generated in Germany at a cost of 10 to 12 cents per kilowatt hour. "Photovoltaics can therefore be an economically attractive alternative to conventional power sources particularly for small and medium-size businesses," explains Sebastian Bolay, energy expert at the Association of German Chambers of Commerce and Industry. Given a market price of 13 to 14 cents per kilowatt hour, it is worthwhile for companies to generate their own electricity with their own small-scale photovoltaic power stations. Although the investment in solar energy takes 5 to 10 years to amortise, companies with photovoltaic electricity generated on site take the strain off the environment and offer their customers products resulting from eco-friendly methods – an argument likely to sway customers with

strong ecological aspirations. In addition, companies generating their own solar power can reckon with fixed power costs for the 25 years or more of their installation's lifetime, while electricity from the grid is certain to rise.

Maximum efficiency

In its basic strategy and also with its products, Mitsubishi Electric has armed itself for the new market requirements. In its Environmental Vision 2021, the company has committed itself to cut carbon emissions in production and in the use of its products by 30 per cent. The concept of sustainability is also prominent in the innovations developed by Mitsubishi Electric. The research & development centres in Japan, North America, France and the United Kingdom are constantly bringing forth new products and processes – and most recently, the Tubular Shaft Motor that is respon-

sible in production machines for high technical precision and performance.

The drive is also employed in the MV Series of wire-cut EDMs launched by Mitsubishi Electric in 2012. Wire-cut erosion machines are metal-removing machine tools that process workpieces made of electrically conductive materials. "Our technology offers the greatest possible functionality, as it combines the traditional strengths of our EDMs, such as quality, flexible applications and productivity, with an innovative drive strategy. The MV Series is a chance for our customers to obtain high-end machines that, in terms of their performance and quality features, were previously reserved primarily for a select band of customers with fatter purchasing budgets. In short, the machines of the MV Series offer the customer an outstanding price-performance

ratio, with the purchase paying for itself in a very short time," says Hans-Jürgen Pelzers, Manager EDM Sales Department at Mitsubishi Electric Europe. As the new wire erosion machines consume only little power and the input of wear parts and consumables has been heavily reduced, the overheads of the MV Series can be as much as 42 per cent lower than those of machines currently in widespread use. Mitsubishi Electric is therefore putting manufacturing companies in a good position to meet the requirements of the market with resource-conserving technology.

www.mitsubishi-edm.de

Electrical discharge machining in record time

More efficient and faster production machines are the goal of research & development worldwide. The British company Premier Precision Tooling (PPT), a maker of precision parts for the automotive and aerospace industries, has been operating an MV2400S from Mitsubishi Electric since May 2014 as a replacement for its Mitsubishi Electric predecessor, the FA20. By using the innovative machine, PPT has cut production time by 25 per cent. A component that used to take 24 hours to machine is now finished

by the MV2400S in 18 hours. The machine not only requires less cutting wire and maintenance, but also consumes much less power. PPT has thus cut its electricity bill by over EUR 1000 per month.

The improved efficiency is essentially attributable to technical refinements like the new Tubular Shaft Motor that drives the main axes of the MV2400S and the demand-driven intelligent control of the generator and ancillary units.



Mitsubishi Electric

Intelligent production machinery saves energy.

Founded in
1990

180
employees

Development, design and construction of machines and lines for the automation of production processes

Precision and innovation – these are the keys to the success of XENON Automatisierungstechnik GmbH founded in Dresden in 1990. Its customised lines for the assembly and testing of mechatronic systems enjoy an outstanding reputation worldwide. Today, the owner-run company ranks among the leading suppliers of complex, turnkey automation equipment.

XENON Automatisierungstechnik GmbH

Leaping
into the unknown.

“Getting started,” Production Manager René Pätzold still clearly recalls, “was a leap into the unknown.” As a spin-off of the measurement and testing equipment activities of state-owned East German enterprise VEB Robotron Messelektronik under a management buy-out, a team of eleven employees got down to work in the new company in 1990. The young workforce under

the management of Dr Reissmann senior soon managed to attract its first orders to Dresden. “All the same”, Pätzold adds with a smile, “we didn’t exactly have ideal premises at the time. Our final assembly area was the right size but it didn’t have suitable truck loading gear for handling the machines.” However, ultimately the Dresden start-up company didn’t have any difficulty in



XENON Automatisierungstechnik GmbH

Leading supplier of automation systems.



Dana Kasprick, Management Assistant in conversation with the journalist from Profile

The latest state of technology

As a high-tech plant engineering company, XENON aspires to high standards of development, programming and production. “We don’t aim to produce all the necessary parts and subassemblies ourselves,” the production manager explains, “but we’ve got reliable component suppliers that we work closely with and whose skills and specialised production technologies we can rely on.” Largely due to its encouraging experience with suppliers, the company hasn’t significantly extended its parts production since its founding. For XENON it’s important to always keep pace with the latest production technologies and thus stay on the same footing as its suppliers. “As a technology company, we are strongly committed to mastering the relevant technologies on our own site. This is why we installed a 5-axis CNC milling centre five years ago, immersed ourselves in the specialised technology of hard milling and started operating a NA1200 wire-cut EDM from Mitsubishi Electric in 2013,” Pätzold explains. By building up its EDM capability, XENON also hoped to boost its research & development and to speed up its parts supplies to customers.

Research & development work in all companies is subject to high safety standards, and these are best upheld on one’s own premises. Among other things, it’s a question here of fabricating special combination parts, testing new materials and defining precision classifications for production.

“Our design engineers and technicians always want to produce their parts with the highest-possible precision,” Pätzold quips. “However, if we are to maintain and build on our position on the market, we have to keep an eye on costs and only ever achieve the degree of precision that’s actually necessary.”

Supplying spare parts at short notice

After-sales service, which is responsible for quickly supplying customers with replacement parts, provides another weighty reason for investing in

finding suitable facilities. Today, after almost 25 years of continual growth and over 1,200 supplied units, XENON is one of the leading sources of complex, turnkey lines for the assembly and testing of mechatronics systems. Some 180 employees, half of them university and technical college graduates, engage in research, development and production for the company. As an independent systems integrator, XENON masters an abundance of production technologies and, as a result of the many years of cooperation with its customers, has gathered wide-ranging experience of technological processes and methods. “It’s our goal,” Pätzold explains, “is to build highly dependable automation lines that enable our customers to optimise their production activities and operate highly efficiently and cost-effectively.” The company’s strategy is to deepen its core competences in automated electronic and mechatronic production and actively exploit synergies between automotive engineering, electronics, photovoltaics and medical technology.

XENON is one of the leading sources of complex, turnkey lines for the assembly and testing of mechatronics systems.

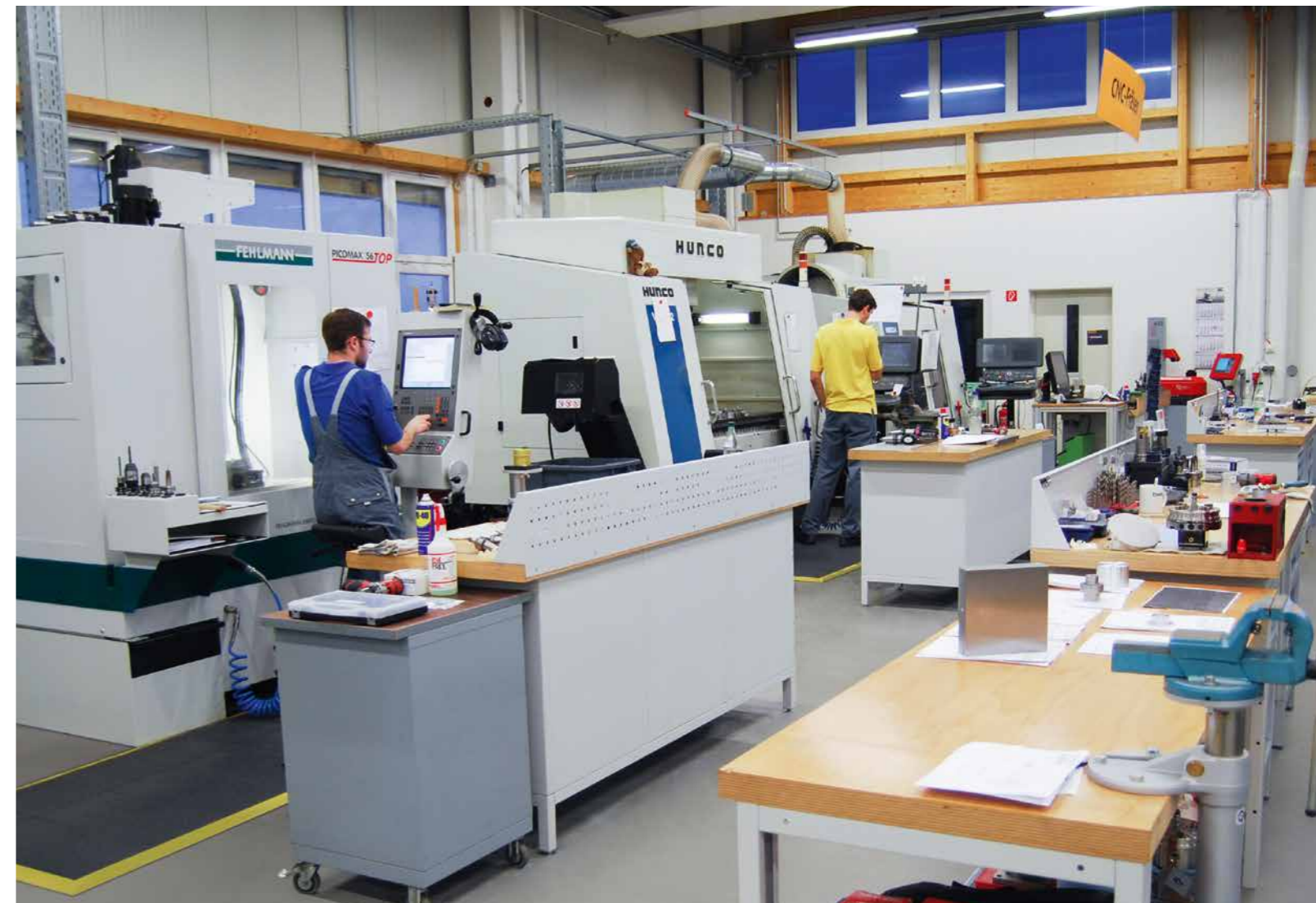
advanced production technology. Since XENON produces customised lines, all the components and subassemblies are one-offs. Nevertheless, customers expect a parts supply that runs just as smoothly as their lines. For XENON’s after-sales service, this means having the demanded parts replicated at short notice, either on its own site or externally. “Even if our outside suppliers are keen to help us with supplies of replacement parts, it is sometimes difficult to procure the parts required by the customer within the desired time,” says Pätzold speaking from experience, “and this is where we expect the new wire-cut EDM system from Mitsubishi Electric to really ease the pressure, as we have direct

access to it and can set our machining priorities ourselves.” The decision to move parts machining and purchasing into a new building and to expand in-house parts machining with extra machines and manpower was taken in 2012.

Decision in favour of wire EDM

At XENON, each investment decision is preceded by intensive consultations internally and externally. In the extension of its own production capability, the Dresden company sought expert advice from commercial agents Richter und Hennig who can look back on many years of experience of both wire EDM and high-speed cutting.

Largely due to its encouraging experience with suppliers, XENON hasn’t significantly extended its parts production since its founding in 2004.



What they wanted was to identify the technologies that will be necessary for XENON in the coming years so that they can give themselves a bigger safety margin and stay on a par with their suppliers technologically. XENON opted for wire-cut EDM technology. All the same, to choose the “right” machine for the company from the huge number of wire EDM systems available, the XENON team was not satisfied with a glance at manufacturers’ glossy brochures or visits to trade fairs.

“Of course, we trust what the machine manufacturers tell us,” Production Manager Pätzold assures us. “But we still like to check this information against the practical experience of reference companies. In meetings with the representatives of machine manufacturers, you soon notice whether they’re interested in meeting the customer’s needs or only in achieving sales targets and how frankly they discuss the various issues.” Nor does XENON underestimate such soft factors as cooperation with the manufacturer in unscheduled situations.

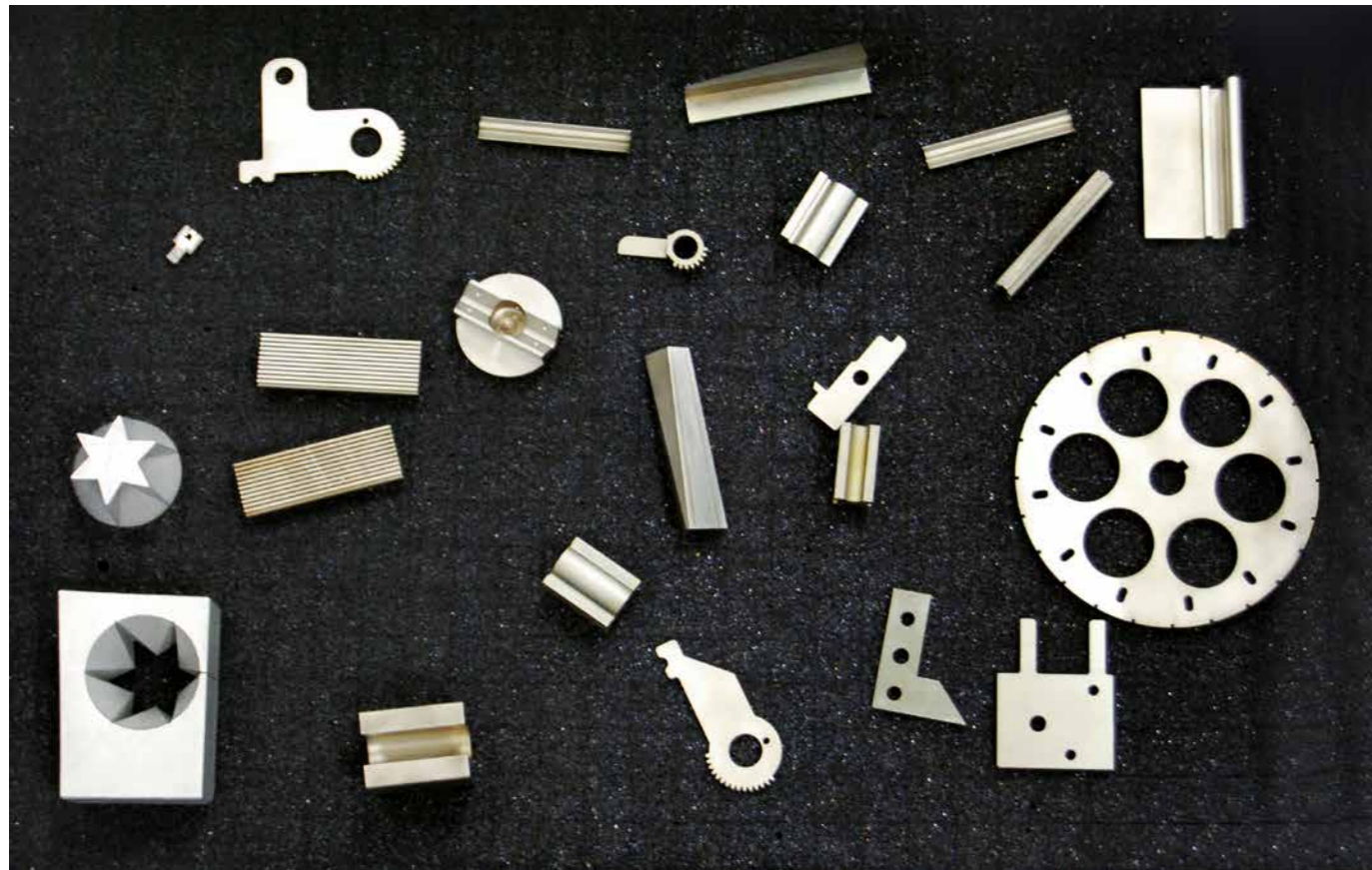
In addition to the machines’ performance data, the decision-makers were interested in the following points:

- Good references
- Good machine quality
- Quick and smooth-running technical service
- A reliable and transparent calculation of downstream costs
- A rough estimate of the cost of servicing and replacement parts

EDMs under scrutiny

Direct comparisons of several rival machines on the principle of consumer tests would be desirable but are usually out of the question for reasons of cost. One of the reference companies visited by XENON, AWEBA Werkzeugbau GmbH in Aue that runs over 20 EDM systems of different makes, offered to help XENON make its choice. It so happened that, for its own production

XENON cuts workpieces into many different shapes with high precision.



Company profile

XENON Automatisierungstechnik GmbH

XENON Automatisierungstechnik GmbH

Heidelberger Strasse 1
01189 Dresden, Germany
Tel +49 351 40 209-100
Fax +49 351 40 209-109
mail@xenon-automation.com
www.xenon-dresden.de

Managing Directors

Tobias Reissmann
Dr. Hartmut Freitag

Core business

Development, design and construction of machines and lines for the automation of production processes

Employees

180

Founding year

1990

activities, AWEBA Production Manager Thomas Schlemmbach had closely inspected the EDM systems of interest to XENON back in 2011 and compared the findings from competition machines with those from a Mitsubishi Electric NA2400. The emphasis here was on cutting time as well as on the dimensional accuracy and surface finish of the machined workpieces. It was an advantage that Schlemmbach was able to conduct these series of tests with a totally open mind, as machines from Mitsubishi Electric were new to AWEBA at the time. The gratifying outcome for XENON was that Mitsubishi Electric not only came out on top in terms of quality, but also featured an impressive price-performance ratio. “We bought a complete package from Mitsubishi Electric,” Pätzold explains,

“consisting of the wire EDM system, a start hole drilling machine and CAM system. Everything was mutually compatible and cost less as part of a package. In December 2013, we started work with the NA1200 and, a year later, I can honestly say that we made the right choice.” In the new parts production building, XENON has already allocated space for another EDM system in the air-conditioned zone next to the NA1200 from Mitsubishi Electric.

www.xenon-dresden.de



“It’s our goal to build highly dependable automation lines that enable our customers to optimise their production activities and operate highly efficiently and cost-effectively.”

René Pätzold

Production Manager
XENON Automatisierungstechnik GmbH



The reason for Kuhn's choice of a Mitsubishi Electric machine was the good reputation of the company's technical service.

Founded in
1990

15
employees

Design and manufacture of a huge diversity of production tools

Whenever particularly complex tools have to be machined, the workforce of K+S GmbH Modell- und Formenbau is in its element. The reason for this is its vast expertise in terms of machining methods and materials and also in terms of modern machine tools. The latest addition to the machine park is the Mitsubishi Electric FA50-S Advance V that is now opening up new opportunities.

K + S Modell- und Formenbau

New opportunities. Complexity welcome.

When you enter the premises of K+S Modell- und Formenbau, you can't help being surprised. In the foyer of the modern industrial building stands a huge, round bathtub from Hansgrohe that you're normally more likely to find in

glossy brochures. Rudolf Kuhn, Managing Director of the company in Waghäusel, Baden, makes such flights of designer fantasy come true with the aid of down-to-earth machining methods. Previously, bathtubs of this size were simply-

too heavy (up to 600 kg) and didn't sell well. The example in the foyer, on the other hand, weighs only 75 kg and sales have taken off. "We have always been in demand as a problem-solver. Having made little headway with conventional mineral



K + S Modell- und Formenbau

Experts in highly complex tools.



The blank is for an RTM core for the "carbon-fibre aircraft wheel rim" development project, here after 5-axis wire-cutting. The initially closed ring is divided into six segments.



Underside of the core after milling.



Detail of the mould contour on the assembled core.

casting methods, it only took us a year to come up with a special machining process, the tools and the associated surface treatment for this exclusive bathtub," says Kuhn describing the process. However, the production of bathtubs and series of fittings is just one source of work of the medium-size enterprise. For over 20 years, it has been a dependable supplier to leading companies in the automotive component supply, aerospace and sanitary ware industry. The production range extends from CAD and NC programming via the production of a huge diversity of production tools and fixtures through to the production of prototypes and small and medium series using a variety of fabrication methods.

A factor for success has been the development of production methods that at first glance are not so easy to realise. Kuhn's team concentrates on the development of

tools and fixtures for prototypes, and pilot-series and series parts such as battery covers for electric vehicles, inner linings of aircraft, cabin roofs for combine harvesters and tractors, vehicle interior parts and engine compartment shielding.

Alternative to milling

The company first ventured into EDM four years ago with the development of a stamping press for the production of heat shields for underbody panels in cars. All vehicles have a variety of plastic trim linings that are reinforced in places with preshaped metal panels. This serves as a heat shield or is used for noise damping. "Technically speaking, these panels are very difficult to stamp, as they are very thin – usually 0.1 to 0.2 mm thick," Kuhn explains. The production of a suitable press posed a special challenge. The rule of thumb in stamping is that the cut should not be wider than 10 per cent of the material's thick-

ness. This means a cut 1 to 2 hundreds of a millimetre wide. "First we tried milling the press. But as the material is hardened, this wasn't so easy," Kuhn recalls. To achieve the necessary accuracy, the presses were reluctantly sent to an EDM jobshop. This was an unaccustomed situation for the company, as it prefers to handle all the tasks itself. As orders continued to grow, Kuhn was faced with a decision: "Should we invest in another 5-axis milling machine or in an EDM?" The decision went in favour of a wire-cut erosion machine, even though – as Kuhn frankly admits – they hadn't had much experience with this technology. "It was ultimately our experience with the EDM jobshop that tipped the scales," says Kuhn explaining his introduction of this form of machining. It had been difficult to find an EDM specialist who could meet the company's quality standards and also operated machines with large workspaces.

"In Germany we found just one – for milling work, there's plenty of capacity, however," says Kuhn.

Thinking big

Kuhn then visited the EMO to find out about EDMs and chose the Mitsubishi Electric FA50-S Advance V. The reasons for this were not only the technology, but also the good reputation of the company's technical service. "For me, this is almost more important than the running costs," says Kuhn, who almost regrets not having put Mitsubishi Electric to the test in this area yet because he simply hasn't needed to. Another positive feature is that attractive financing options are available from the KfW Bank

because the FA50-S Advance V is so much more energy-efficient than its predecessor. The only drawback was having to wait six months for delivery even though they had already received their first order. The wait was bridged by Mitsubishi Electric with the provision of a slightly smaller replacement machine for this interim phase. The transition period was exploited for familiarising two employees. "The training was outstanding, so we were able to get down to work straightaway," Kuhn explains. It was the experience during this period that vindicated their decision in favour of Mitsubishi Electric. The very first job involved a workpiece whose size pushed the smaller replacement

machine to its limits. "I'd rather invest in a size bigger so I'm equipped for all eventualities than turn down a job," Kuhn insists. With a machining range of 1,300 x 1,000 x 400 mm and maximum workpiece dimensions of 2,000 x 1,700 x 390 mm, the FA50-S Advance V is one of the biggest wire-cut EDMs currently on the market. The new machine was finally supplied after six months and installed on site within a week. The Mitsubishi Electric FA50-S Advance V wire erosion machine was ready to go. The device for large spools of wire and a telephone module were added as special equipment so that the responsible employee can be notified of a machine stoppage by text message. The machine has





“ We can see on a daily basis the new tasks that we can handle with the machine. Jobs that used to be performed on the milling machine are now executed better on the EDM. ”

Rudolf Kuhn

Managing Director of K+S GmbH Modell- und Formenbau, Waghäusel

Company profile

K + S Modell- und Formenbau

K+S GmbH
Modell-und Formenbau
 Industriestrasse 18
 68753 Waghäusel, Germany
 Tel +49 7254 95 882-0
 Fax +49 7254 95 882-90
 info@ks-modell-formenbau.de
 www.ks-modell-formenbau.de

Managing Director
 Rudolf Kuhn

Core business

Design and manufacture of a huge diversity of production tools and fixtures through to the production of prototypes and small and medium series using a variety of fabrication methods

Employees
 15

Founding year
 1990



been in operation for a wide range of assignments since May 2014.

Outstanding precision

The new EDM is mainly used for the machining of stamping presses of high-alloy tool steel and has meanwhile almost replaced milling for this application. “We’re now able to produce the die geometries of the stamping presses in the μm range and with superlative surface finishes ourselves,” says Kuhn outlining the main task. “The dies cut on the machine are a 100 per cent fit. After milling, we’d often found during assembly that certain areas didn’t fit and had to be reworked.” The EDM is also used for producing test tools for these panels. “There really isn’t any good simulation tool for forming tests, particularly if the panels are domed and perforated to reduce noise. Any of these holes can later tear,” Kuhn stresses. Hot-sealing tools to connect the aluminium shielding panels to the plastic are already being produced on the new machine.

Outlook

Kuhn is convinced that there is still plenty of unexplored potential in the new machine. In addition to the production of stamping tools, the company has now used the FA50-S Advance V for developing an RTM (Resin Transfer Moulding) mould which will later be instrumental in the production of carbon-fibre aircraft wheel rims. Another application is diamond blades for cutting concrete on which the teeth have broken off. To weld on new teeth, extremely flat surfaces are required – a task executed to perfection by the new FA50-S. “We can see on a daily basis the new tasks that we can handle with the machine. Jobs that used to be performed on the milling machine are now executed better on the EDM,” says a delighted Kuhn. With this experience under his belt, the company can now itself offer jobshop services. What he has discovered is that, with its own machine on its premises, he now has a better feel for the machining steps. Kuhn is now amazed that he

used to mill the workpieces three-dimensionally before sending them to the EDM jobshop. After machining the same workpiece on his own machine, it quickly became obvious that it makes more sense to first wire-cut the material flat and then to mill it. “When you’ve got your own machine, you’re more flexible. You can modify the machining procedure and develop many new ideas – and that’s the recipe for success for a small business,” says Kuhn in conclusion.

www.ks-modell-formenbau.de

A source of superlative surface finish.



K + S Modell- und Formenbau



Industry has a new top event to look forward to. At the beginning of May, the tool-, pattern- and mouldmaking world is meeting for the first time at Moulding Expo, the new trade fair in the technology portfolio of the Messe Stuttgart exhibition centre. And the signs are that the first-time staging of the new format will be a big success. Find out here why this is the case, what Messe Stuttgart is offering and what visitors can expect.

Moulding Expo Stuttgart

The perfect showcase for generating business.

From Tuesday, 5 May, until Friday, 8 May, the premiere is taking place in the Land capital. The three envisaged halls amounting to 31,500 square metres of total space will be fully booked, with well over 400 exhibitors for the debut event. One of the main reasons for this positive response is that the strategy for the new trade fair was developed and coordinated in advance with the relevant

industrial companies in this high-performance sector (EUR 8.8 billion sales in 2012). The event is also being supported by the foremost industrial associations. Serving as the technical sponsors are the Association of German Tool and Mould Makers (VDWF) and – new in this capacity – the Federal Association of Model- and Mouldmakers (MF). The conceptual sponsors of the new



Moulding Expo Stuttgart

A totally new top event.



Profile

Prof Dr Thomas Seul is the Vice-President for Research and Transfer at Schmalkalden University of Applied Sciences and President of the Association of German Tool and Mould Makers (VDWF). The main areas of his research work can be found in the product development of plastics components and in tool and mould design, specifically for medical technology.

international trade fair are the German Engineering Association (VDMA) and the German Machine Tool Builders' Association (VDW). "And this cooperation was really great fun for all of us. It was professional, business-like and marked by great earnest," as Prof Dr Thomas Seul, VDWF President, stresses.

A showcase for the industry

What was the main motivation for establishing a new trade fair? "We had the impression that alternative

events were confining themselves excessively to component supply business for tool- and mouldmaking. This is why we now want to offer the industry its own platform. Its purpose is to generate business directly and present itself to precisely those customers that will ultimately buy their tools and moulds," says Seul. The fair is divided into several exhibition areas. First of all, classical tool- & mouldmaking and pattern- & mouldmaking with their shaping tools and moulds, plus various gauges, jigs and fixtures, will be on show. And then,

View inside a busy exhibition centre hall.



MOULDING EXPO
International Trade Fair
for Tool, Pattern and Mould Making
5-8 MAY 2015 MESSE STUTTGART



An example of how lightweight materials are produced can be found at the Institute of Aircraft Design (IFB) of the University of Stuttgart. Reels of carbon fibres attached to the inside of the rim of this 2 m tall braided wheel braid the 78 threads when it is turned.



The trade fair pavilion, a hybrid lightweight structure

visitors to Stuttgart can also expect systems and service providers in the field of plastics technology and metalworking, ranging from machine tool manufacturers and hot-runner suppliers to software firms. In addition, the associated users – those from the automotive sector, medical technology and the plastics industry, for instance – will also be exhibiting their products in Stuttgart.

Focus on top-flight technology

In addition, Moulding Expo will also be functioning as an indicator of new trends. "What technological trends are taking shape? In what direction should tool- and mouldmakers be moving? And how will the machine parks, technologies and business models of the future look?" is how the VDWF President sees further themes of the trade fair. There will be a focus on the very latest technological processes, which will be presented on site. Visitors can find out, for example, how Embedded Systems are capable of importing intelligence into machines by storing in the tool or mould such information as article and production data, maintenance plans and all the process data from the first sample phase onwards. In this way, the tool or mould can be simply removed in one place and set up again somewhere else. "Offering these services and generating downstream business is absolutely essential for the sector. Demand-

driven maintenance that the machine automatically requests rather than maintenance to schedule – this is a grand vision for the business models of the future," Seul comments. The new trade fair format is rounded off with two accompanying events, the KSS trade fair for safe cooling, lubricating, cleaning, oiling, greasing and Control, the international trade fair for quality assurance. This means that visitors to Stuttgart will have the unique opportunity to obtain the whole spectrum of information of relevance to the industry on a single site. "We are firmly convinced that, on a single day at Moulding Expo, the trade visitor will be able to find out all he or she needs to know about the latest technologies and trends in the industry and meet all the leading lights in the industry on site. In this respect we're offering the trade visitor unparalleled added value. It'll be really good. I'm really looking forward to Moulding Expo!" says the VDWF President.



Interview – “Promoting the brand”



Ulrich Kromer von Baerle
Exhibition centre CEO
on MOULDING EXPO

In view of the rapid expansion of electronic information exchange among market participants, are trade fairs still of importance for German industry in the digital age?

Kromer: Definitely. Customer relations in tool-, pattern- and mould-making depend on mutual trust. Tools and moulds are skilfully crafted high-tech one-offs that are used by customers for the industrial production of large product series. At contract award, many parameters of the tool such as the tolerances of the products they will make or the use of semi-finished products often haven't yet been defined. The toolmaker is thus becoming increasingly a consultant and service provider before and after toolmaking proper. Marketing and project work solely over the phone or by email will only work here to some extent. At the same time, technological progress is continuing to advance on all levels. So trade fairs are a useful shop window where any tool-, pattern- or mouldmaker can find out specifically and in detail about the latest technologies at a single location. In addition to the expertise in the companies, it is the quality of the supplied products and services – ranging from machine tools and standardised system components and materials through to software for production and organisation – that has a large influence on the excellence of the produced tools, moulds and patterns.

How do you see Moulding Expo's position?

Kromer: Trade fairs in the tool-, pattern- and mould-making sector are changing and Stuttgart is ready with its modern trade fair and congress centre that opened in 2007 to offer the sector a fitting home. The premiere in May 2015 will be a success – this is demonstrated by the extremely gratifying level of exhibitor registrations. And in the coming years, on a biennial basis, this showcase for German tool- and mouldmaking will again be taking place in the Land capital.

How do you expect the show to act as a stimulus?

Kromer: Internationally, tool-, pattern- and mouldmakers in Germany produce top-quality work, yet it is small and medium-size enterprises that predominate. Customers are often unable to see the toolmaker as a partner and supplier of solutions; nor do they realise that tools and moulds are key elements in a complex product development and production context. In the last few years, the idea of networking has taken root increasingly in the sector. “German tool- and mouldmaking is a brand,” is how Prof Seul puts it. This brand can and will be shown, cultivated and promoted in Stuttgart. This can also be seen as a bid to strengthen Central Europe's position as a centre of manufacturing industry.

A total of four associations have teamed up for this fair. What is the importance of cooperation on this scale?

Kromer: It shows that everyone involved means business. Messe Stuttgart is a service provider and, to breathe life into Moulding Expo, has attracted the participation of the industry's four leading associations as its conceptual and technical sponsors. These are the Association of German Tool and Mould Makers (VDWF), the Federal Association of Model- and Mouldmakers (MF), the German Engineering Association (VDMA) and the German Machine Tool Builders' Association (VDW). “From the industry for the industry” is the Moulding Expo's motto. And this is being brought to life in the committee meetings and the joint events and gatherings in the preparation of the fair.

The trade fair's purpose is also to promote Germany as a manufacturing location. Why, in your view, is this necessary? What kind of a boost does industry additionally need?

Kromer: If production is possible all over the world with the same machines, the same software and the same set of digital data for tool design, then it is the technical expertise that makes the difference. This covers such skills as problem-solving competence, being able to spot flaws early on in production and seeing things from the customer's point of view. And in the injection moulding of plastics, thinking in terms of the shaping and stamping of sheet metal or the casting of metal. This is made possible by the high standard of apprenticeships and further training. Moulding Expo is therefore a lobby for

the industry. We want to give up-and-coming tool-, pattern- and mouldmakers an impression of the exciting and varied activities in the industry.

“Industry 4.0”, “industrial revolution” – the themes of the fair reflect the fact that we are in an age of change. How far-reaching you expect this change to be?

Kromer: The ideas embodied in “Industry 4.0” are already “unconsciously” established in the minds of tool-, pattern- and mouldmakers already operating successfully on the market today and are a permanent feature of their everyday work. The industry puts aspects of Industry 4.0 into practice not only in automation but also in up- and downstream processes in development and on partner and customer sites.

What can policymakers and industry do to collectively and successfully negotiate this process of change?

Kromer: There's a whole host of challenges that could be jointly tackled, challenges that are giving tool-, pattern- and mouldmakers a hard time. For instance, the continuing squeeze on margins caused by globalisation. And then there are the fluctuations in the business cycle, the migration of target markets to the Far East, and the shortage of skilled staff due to demographic change.

www.messe-stuttgart.de/moulding-expo



Profile

Ulrich Kromer von Baerle has been President and CEO of Landesmesse Stuttgart GmbH (formerly SMK – Stuttgarter Messe- und Kongress GmbH) since 2001. He is in charge of the company as a whole, of trade fair business and interdisciplinary tasks. Von Baerle has also been Managing Director of Projektgesellschaft Neue Messe GmbH & Co. KG since 2004.



Founded in
2000

12
employees

Jobshop for precision parts as prototypes and in small series for fastener manufacturers, packaging specialists, and the automotive and aerospace industries

What's the best way for a jobshop to improve its market standing? AMEP in La Chapelle has added wire-cut EDM to its armoury of machining techniques consisting hitherto of turning, milling and grinding. The production company benefits from this in two ways: firstly, by improving its flexibility and value generation; and, secondly, by attracting new customers.

SARL AMEP

A new technology for a higher profile.

As a manufacturer of small precision parts, AMEP's business has undergone remarkable development. It all started in a small workshop in 2000 with two partners, Jean-Pierre Morin and Christian Mignon. On conventional milling

machines and later, with the purchase of a new grinding machine, they produced various metal components under contract. Within a few years, the company had made a name for itself as a maker of precision turned parts. Morin, today one

of the two bosses in La Chapelle, describes what happened next: "In 2009, an economically extremely difficult year, my partner Christian Mignon and I decided to adopt a proactive strategy. Contrary to the general trend, we invested in

Greater flexibility and value added.



Jacques Meudec, wire EDM specialist, and Jean-Pierre Morin and Christian Mignon, who jointly manage AMEP (from the left), are delighted with the high-grade machining results of the MV1200S wire-cut EDM machine during the cutting of press samples.

a third machining centre, as these machines were going very cheap at the time.” The strategy of extending his services with a new machining technology subsequently proved to be highly successful. Attracting new customers, the still young and small firm emerged from the economic crisis with renewed vigour. Today, AMEP in La Chapelle generates annual sales of EUR 950,000 with twelve highly skilled employees. The machine park consists of three machining centres, two NC-controlled lathes, two grinding machines and three conventional lathes. The company now has an air-conditioned measuring room and modern 3D measuring equipment. With its great reliability coupled with outstanding quality, AMEP is a highly reputed and much appreciated partner in the region. The jobshop does business with automotive engineers, fastener manufacturers and the aerospace industry.

Continuing the successful strategy

Continuing business success has prompted Morin and his partner

Mignon to extend their production site in La Chapelle several times. In addition, they decided in the summer of 2014 to invest in the future by adding a new machining technology – and purchased an MV1200S wire-cut EDM from Mitsubishi Electric. “Wire erosion is a sensible addition to our range of activities. For special components of high quality and precision, we now have the complete array of machining technologies on our site,” Morin explains. Wire-cutting yields several decisive advantages for a jobshop, mainly by boosting flexibility. Independently of subcontractors, the company can now make complete components itself at low cost and short notice, whatever the machining technology required. In addition, the jobshop has enhanced value generation on its own site. As Morin reports, he used to have to subcontract out annual orders worth about EUR 50,000. “In addition to the financial side, expertise is also an important factor. Thanks to our extensive knowledge and our accumulated experience of a machining technology, we can es-

timate our costs and the required time to produce a component much more accurately. This means we can quote a price much faster and with greater precision in response to an inquiry,” Morin adds. “What’s more, specialised and exotic technologies like wire-cutting give us a higher profile as a specialist company in eyes of the customer.”

Familiarisation within a matter of weeks

Morin and Mignon had plenty of reasons for choosing an MV1200S from Mitsubishi Electric: “We initially had a number of recommendations from neighbouring companies who had been very satisfied with their experience of machines from Mitsubishi Electric. They stressed above all the high quality, reliability and fully equipped state of the machines. What finally clinched our decision, however, was Mitsubishi Electric’s technology database strategy,” Morin adds. To give effective support to still inexperienced users of wire-cut EDMs, the database contains suitable and proven process and machine parameters

for a huge range of materials and machining tasks. The control of the wire erosion machine effectively puts over 40 years of accumulated experience of the technology at the user’s disposal. This makes getting started with wire-cut EDM much, much easier. The programmer and operator can quickly and simply configure the process with the stored parameters in such a way that machining is successful from the outset. With increasing personal experience, the operator can of course modify the parameters to suit his own needs. In doing so, he is aided by the software ergonomics of the current ADVANCE PLUS control from Mitsubishi Electric. As Morin confirms, his skilled employee Jacques Meudec was able

to accurately machine the first workpieces on the MV1200S from drawings after only a few days. After just three or four weeks, wire erosion was fully integrated in production – with Meudec being assisted by his own previous experience of wire-cutting technology.

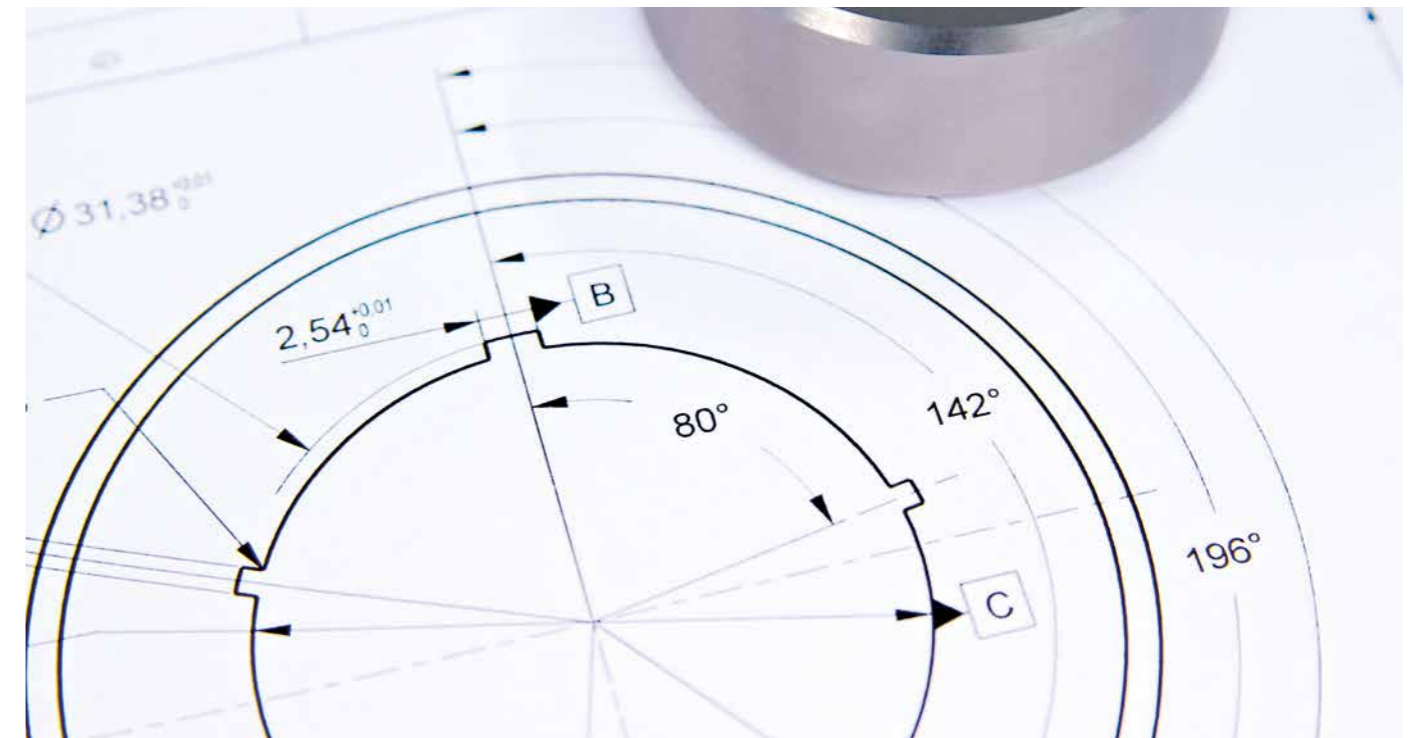
Unsupervised production

Meudec imports the drawing data for the workpieces awaiting machining from the MasterCAM CAD/CAM system. For single pieces, he can also program the geometries at the machine. After what is now several months, he particularly appreciates the reliable operation of the MV1200S. He can thus cut several elaborate and complex components from a single plate during

unsupervised night shifts – a process aided by dependable automatic wire threading. In the event of a wire breakage, the machine automatically searches for the re-entry position, rethreads the wire at the breakage point and resumes machining. This function keeps the machine running smoothly. The penetrations on some components have sharp edges without transitional radii. Moreover, the contours of the inserts with 10 to 15° angles have to be cut through the full thickness of the workpiece. And only wire-cutting is capable of this.

Encouraging team spirit

Apart from the technology, Managing Director Morin considers his style of management as one of the keys



Wire-cut EDM is technically and economically the best technology for machining radial grooves with sharp edges in press dies.



The MV1200S wire EDM from Mitsubishi Electric has fulfilled all the expectations of the jobshop in La Chapelle.

to the company's success in the positive development of its production activities. "Since our business is small and only has a few employees, we attach great importance to team spirit. As skilled staff, we want our employees to have as much freedom as possible to shape and optimise their work processes themselves. In addition, by giving them tasks involving different machining technologies, we want to stretch them and develop their skills. This makes the company as a whole highly flexible. By accepting responsibility for their work, they

also become quality-conscious. The result of this is satisfied customers who come back to us with lucrative jobs – in the end, everyone benefits," says Morin outlining his business ethos.

www.amepfrance.com

Open Day at AMEP

To quickly publicise their range of services and particularly their addition of wire-cut EDM, Jean-Pierre Morin and Christian Mignon organised an Open Day. Almost 200 specialists and managers from companies of the metalworking and plastics processing industries in the region took up the invitation. On two consecutive days, they

had the chance to find out in detail about the machine park, manpower skills and the services of the AMEP jobshop in La Chapelle. As Morin stresses, an Open Day is a unique opportunity to get to know potential customers personally in a business atmosphere and bang the drum for the company.

Company profile

SARL AMEP

AMEP France

46, zac du Moulin aux Moines
72650 La Chapelle
Saint-Aubin, France
Tel +33 2 43 241 349
Fax +33 2 43 283 781
contact@amepfrance.com
www.amepfrance.com

Managing Directors

Jean-Pierre Morin
Christian Mignon

Core business

Jobshop for precision parts as prototypes and in small series for fastener manufacturers, packaging specialists, and the automotive and aerospace industries

Employees

12

Founding year

2000

Interview



Jean-Pierre Morin
Managing Director

What's the key to your success?

We're open to tight delivery deadlines, offer a comprehensive range of machining technologies and achieve customer satisfaction with the superlative quality of the machined parts.

What does your company do in just a few words?

We produce metal prototypes and components in small series for fastener manufacturers, packaging specialists, and the automotive and aerospace industries.

What's your source of motivation?

Positive feedback from satisfied customers gives us the necessary motivation for future investments.

What do you do now differently from five years ago?

In accordance with our business strategy, we've continuously invested in the business and now have a larger number of lathes, milling machines and grinders and a larger workshop. We've also added wire-cut EDM as a machining technology so that we can offer our customers solutions for every conceivable metalworking task.

What projects do you have in the pipeline for the company's future development?

We want to extend our jobshop capacity. This includes attracting further customers and investing in manpower, buildings and machines at our La Chapelle site.

What was your biggest business success to date?

With the aid of our proactive strategy, we came through the difficult situation in 2009 almost unscathed.

What attributes do you particularly value in yourself, your employees, subcontractors and customers?

Cooperation is only fruitful if all concerned deal with each other in a spirit of honesty, frankness and complete trust.

How do you manage to find the right balance between work and leisure?

I'm a lover of classic cars and particularly of rare and elegant vehicles of decades past. In addition, I enjoy the peace of running – jogging – in the countryside.

How would you explain to a layperson in just a few words what your company does?

Among other things, we cut metal with very thin wire and electric current.

Founded in
2000

19
employees

Initial and further training – vocational foundation and training workshop at the interface between industry and society

Innovationszentrum Fennel



Apprenticeships and further training are becoming essential for machine tool manufacturers if they are to continue to thrive in Germany. Mitsubishi Electric is therefore lending its support to the Tool- and Mouldmaking Teaching Factory. German tool- and mouldmakers rank among the best worldwide. Few other sectors have comparable staff expertise combined with so much productive technology. And few other countries have such thriving and dependable customers as the automotive industry, electronics and communications industry, medical technology, aerospace and precision engineering.

IZF

Turning out skilled employees.

Mitsubishi Electric lends its support to the IZF.

Germany's infrastructure, from the component supply industry and tool- and mouldmaking through to the customer industries, still leads the world. All the same, it is important not to forget that we are in the throes of in some cases rapid change, and this is confronting German tool- and mouldmakers with new and increasingly tough challenges. Responding appropriately to the

changing situation presupposes, however, a redefinition of the services provided. Required among other things is advanced and highly productive software coupled with high-performance machine tools and workshop management systems. For instance, it will be increasingly important from now on to invest in automated machine systems displaying high flexibility and process

Technology and expertise for a sound future.



IZF



Sophisticated technologies in an attractive setting: a glance inside the forum at the IZF

availability. The machine rate and hence the cost of a tool or mould will then be lower and the price-performance ratio will be competitive or, better still, superior so that purchasers do not inevitably turn to alternative suppliers on the global market. Right at the top of the list, therefore, are suitable software and equipment

and, crucially, the matching manpower. Human resources with initial and further training will thus become increasingly important so that the labour market can be supplied with those people whose high standard of expertise is vitally important for German industry as a whole and for our small and medium-size businesses.



Only those who manage to go about their exacting work quickly and with high productivity from the outset will have outstanding chances of success in the long term in our high-wage country. We at Mitsubishi Electric are therefore committed – and this is an important strategy for the future – not only to develop high-performance technologies in the electric discharge machining sector, but also to take responsibility for the training of the necessary technical staff. Mitsubishi Electric is an extremely large company. But a company doesn't become successful today through size alone. One of the sources of our success is our cultivation of partnerships locally all over the world. This philosophy has made Mitsubishi Electric into a strong and efficient supplier of EDM technology for many years. In the context of our cooperative approach, we attach great importance to partnership with schools, training establishments and universities – always, and with long-term vision,

Response in the daily German press (Westfalenblatt/Neue Westfälische)

in the company's own interests. We have therefore approved a package of measures that, in connection with an internal funding programme for teaching establishments, schools and universities, also extends to the financing and sponsorship of tool- and mouldmaking, industrial automation and general CNC technology. We are very happy to have found a partner in the visionary Innovationszentrum Fennel (IZF) initiated as a foundation by businessman Bernd Fennel. With this centre, we share the same ambitious corporate values in the social sector and the same attitude towards technology. We believe that the strategy of the IZF perfectly embodies our conception of the modern training of skilled staff. The structure of the newly established Tool- and Mouldmaking Teaching Factory transcends the conventional approach that considers the various technologies in isolation without an overarching strategy, making it, in our opinion and one shared by experts, excessively

one-dimensional. It is precisely this holistic consideration of a continuous process chain that is becoming more and more important and will ultimately bring forth the skills that are capable of strengthening our tool- and mouldmakers and Germany as a manufacturing nation. The standards today are already high and will continue to rise. The profession of tool- and mouldmaker will continue to evolve and, viewed in its entirety, will culminate in an integrated profile of design, software, programming techniques, advanced process engineering and automation.

The "Industrie 4.0" project initiated by the German Federal Government, a high-tech forward-looking strategy that promotes intelligent production and networking with the involvement of advanced, web-based technologies for the control of automation processes, self-diagnosis methods, self-optimisation and

At the official opening of the teaching factory, the newly installed wire-cut EDM attracted lively interest from the expert public.



Excellent opportunities in a high-wage country.



self-configuration is additionally reinforcing this general thrust. These trends call for a broader array of proficiencies. In addition to an understanding of the process proper, there is a need for the ability to think outside the box, practical skills, decision-making competence and a broad conception of customer orientation. Anyone who appreciates this will have better opportunities for the future, we believe. Located in an exciting cluster region with a strong tradition of plastics processing and metalworking, Bad Oeynhausen is an extremely fitting location for our commitment in Westphalia. To mark the launch of the Tool- and Mouldmaking Teaching Factory, Mitsubishi Electric is installing a highly advanced MV1200R wire-cut EDM system.

Wire-cutting today is an essential key technology for tool- and mouldmaking. It is only natural and good sense to integrate this technology in the overall process chain in a network with other important technologies. It is therefore important for Mitsubishi Electric to found this network with highly reputed partners who also stand for cutting-edge technology. And this is very much the case at the IZF. CAD, NC programming, the adherence to the relevant standards, the milling and clamping system technology and the automation inclusive of software-based cell management provide the fitting environment for electric discharge machining and facilitate training in the process chain that will plot the course for the future. From now on, German tool- and mouldmakers will have to be integrated in the customer's development activities to a far greater extent than hitherto. Far from being merely suppliers of tools and moulds, they will become indispensable and gain an edge over the competition. Unfavourable demographic trends, on the other hand, are confronting tool- and mouldmakers with a shortage of suitably skilled personnel. The Tool- and Mouldmaking Teaching Factory at the IZF can play a part in remedying this situation. Comprehensive technical training geared to the needs of modern industry constitutes a solid foundation on which to build a career. It offers benefits to both sides, employers and employees alike.

Mitsubishi Electric wishes to make a meaningful contribution to this in cooperation with the IZF. In addition to its Tool- and Mouldmaking Teaching Factory, the



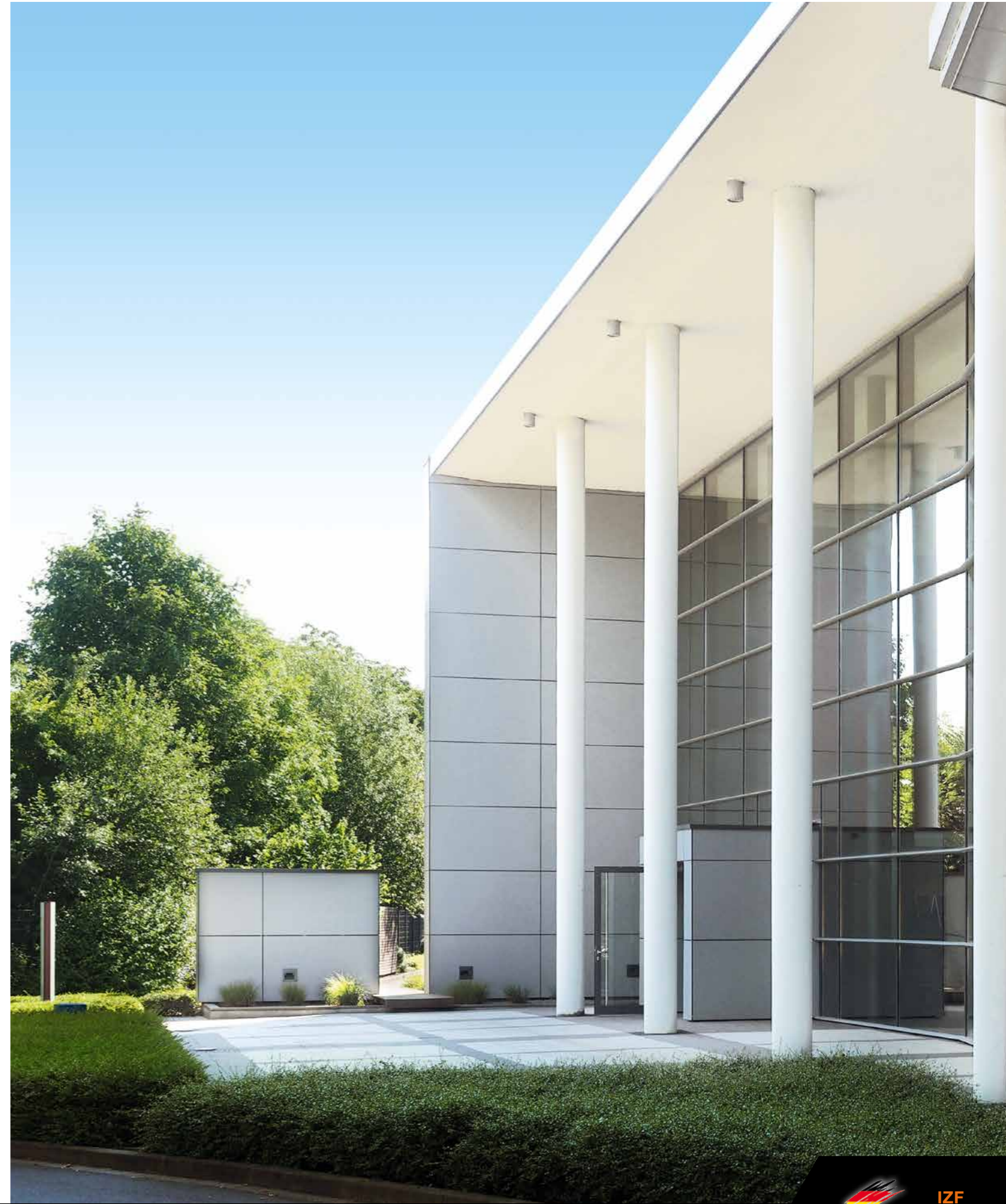
125 guests came to Bad Oeynhausen for the official opening of the new Teaching Factory on 28 January.

IZF also provides the training of EDM specialists. The training course over a period of 12 weeks covers all the basics from programming through to die-sinking and wire-cutting. The first IZF Tool- and Mouldmaking Fair (izf Werkzeug- & Formenbaumesse) is taking place in Bad Oeynhausen on 16 and 17 April. This comprises not only an exhibition, but also offers those interested a chance to find out more about the IZF approach to training.

Partner



www.izfe.de



Benefits to both sides, employers and employees alike.

Founded in
1974

80
employees

Jobshop machining of cubic
components for aerospace and
medical technology

If a jobshop wants to stay competitive, it has to continually improve its processes and work more flexibly and inexpensively. Frédéric Lorentz in Esbly, France, owner and Managing Director of the production company of the same name, therefore has a keen interest in forward-looking technologies. Read on to find out how he boosts his flexibility and productivity and saves energy with his dependable MV2400R wire erosion machine.

Lorentz

The best is yet to come.

MV2400R wire-cut EDM does the work of two.

Frédéric Lorentz enjoys looking ahead. Asked about what he is particularly proud of in his career to date, he replies with a confident smile: "The truly important realisations and successes are yet to come." It is on the basis of this philosophy that he runs his production firm in Esbly in the second generation. His father founded the business as a jobshop back in 1974. From its small beginnings,

the firm has evolved into an internationally recognised supplier to medical technology and aerospace. The firm grew particularly strongly from 1995 to 2005, and today over 80 skilled employees machine mainly cubic workpieces of aluminium, low- and high-alloy steel and titanium on 42 machining centres, 25 of which are 5-axis. "We relish special challenges particularly. Our

Outstanding knowledge and success.

With the MV2400R we are ideally equipped for all coming machining tasks.

strength lies in the production of difficult components that can only be fabricated with ingenious machining strategies," says Lorentz explaining his company's positioning. He doesn't allow himself to be distracted by the general political and economic climate. In his view, pioneering ideas always have good chances of surviving crises unscathed. And this entails making skilful use of special machining technologies and innovative machines. This is why, several years back, he added wire-cutting on machines from Mitsubishi Electric to his range of activities.

On-going optimisation

With the MV2400R wire-cut EDM purchased about a year ago, Lorentz sees himself at the cutting edge of technology. "This machine belongs to the fourth generation of wire-cutting machines from Mitsubishi Electric in our company. We've gone back to the same manufacturer again and again because our experience so far



Even less skilled staff can intuitively operate the ADVANCE PLUS CNC control of the MV2400R wire-cutting machine.

has been very good," Lorentz reports. He is particularly impressed by the fact that the developers and design engineers at Mitsubishi Electric have repeatedly taken up ideas and suggestions from the field in the on-going refinement of their wire EDMs. He and his EDM specialist Jean-Pierre Hornn confirm that the equipment and quality of the current generation have been improved yet again over those of its forerunners.

Productive and efficient thanks to high availability

Automatic threading in Hornn's view is a thoroughly mature technology. It works absolutely reliably and ensures the continuous operation of the MV2400R during unsupervised nightshifts and over the weekend. "When I clamp a plate in the evening from which several components are to be cut, I can count on all the workpieces being completed by the next morning," says Hornn. And this helps the jobber to meet his delivery deadlines. At the same time, he can make extremely productive use of inexpensive unmanned shifts. The reliability of the MV2400R goes a long way towards keeping the company competitive on the international level.

Sustained high productivity is also aided by the machine's minimal maintenance needs. The dielectric is moved much less, and the controllable generator optimises the size of the particles eroded during cutting. In doing so, it takes account not only of the material being cut, but also of different process parameters. This means that the filters remain fully functional for very long periods even during the machining of titanium. As Hornn reports, the MV2400R only needs about a fifth of the filter cartridges used on the already highly efficient machines of the FA and FX series. The much longer



"The MV2400R is so comfortable to program, operate and control that it's almost like being on holiday for the operator," says Jean-Pierre Hornn, EDM specialist at the Lorentz jobshop in Esbly.



maintenance intervals firstly reduce the downtime needed for filter change. This improves the machine's availability and raises productivity. In addition, minimised filter consumption also of course reduces recurrent operating costs considerably. "The MV2400R has thus become the 'piggybank' in production," Lorentz adds. After over a year in service, the jobshop in Esbly has found that the productivity of an MV2400R is one and a half times to twice that of its predecessor generation. The MV series is by far the most mature.

Simple operation with plain-language dialogue

There's another important feature responsible for the high availability of the MV2400R wire-cutting machine.

Lorentz explains: "When our specialist Jean-Pierre Hornn is on well-earned holiday leave or otherwise unavailable, production of course has to continue." Thanks to the extra simple and easy-to-understand operation of the ADVANCE PLUS CNC control, this has never been a problem. Even less skilled employees who aren't entrusted with the machining technology of wire EDM on a daily basis are capable of operating the MV2400R. Managing Director Lorentz, who with a smile claims to be more of a layman when it comes to the technical niceties, is himself able to load and start machining programs and hence successfully cut the currently required components, as the CNC control can be intuitively operated, guiding the operator with graphic support through

Pioneering ideas offer great opportunities.



the required dialogues. "With its comfortable operation and programming, the MV2400R fully meets the needs of a contract manufacturer for maximum flexibility," Lorentz confirms. Machining programs are usually produced at a MasterCAM CAD/CAM workstation and transferred to the wire-cutting machine. Simple workpiece geometries are also programmed by Hornn at the machine's CNC control in the workshop.

Saving energy to minimise costs

Lorentz sees his business's recipe for success not only in being able to find intelligent solutions for complex machining tasks, for the commercial side of the business also has to be regularly optimised. This also includes, in Lorentz's opinion, streamlining organisational structures. This is why he has centralised the company's internal IT, for example. General expenses can also be additionally curbed to a large extent with a number of simple but extremely effective measures. For example, Lorentz has now equipped all the lighting in his office and workshops with LEDs. As he reports, this certainly has its price, but pays for itself quickly as the company will be consuming much less electricity from now on. "As a component supplier, we are under

constantly growing pressure to cut costs. Energy saving is one of the best ways of doing this. It is a contribution to sustainability and resource conservation," says Lorentz. And this also applies to his production machines – and the wire EDM is no exception. He explicitly mentions the characteristics of the MV2400R whose drive and generator technology is geared to minimal energy consumption. Its high productivity due to high cutting speeds in conjunction with optimised process parameters ensures minimal energy consumption per finished workpiece. Lorentz sums up: "With the MV2400R we are ideally equipped for all coming machining tasks. This means we can view the future with confidence, for the best is yet to come."

www.lorentz.fr



"... runs incredibly reliably, is child's play to operate and minimises energy consumption and costs," says Frédéric Lorentz (left) listing the decisive advantages of the MV2400R in conversation with Joël Martin, Product Manager for EDMs at Delta Machines, exclusive dealer for France

Company profile

Lorentz

Lorentz

16, rue Saint Aurice, ZI de la Pierre
Tourneville
Isles les Villenoy
77450 Esbly, France
Tel +33 160 045 558
Fax +33 160 043 203

Managing Director

Frédéric Lorentz

Core business

Jobshop machining of cubic components for aerospace and medical technology

Employees

70

Founding year

1974

Interview



Frédéric Lorentz
Managing Director

Where do you see your company in five years' time?

We shall significantly increase our export share from its current 15 or so per cent.

What was your biggest business success?

The best is yet to come.

What's your favourite way to relax?

I enjoy being out in the country and am a passionate golfer.

If you were asked what your company does by a friend with no technical knowledge, how would you explain it?

We get metal into the desired shape.

How do you practise energy efficiency on a daily basis?

Energy efficiency is of great importance to me and my business. We constantly examine all ways of reducing energy consumption and hence costs at work. This applies, on the one hand, to installations and the equipment of buildings and machines and, on the other, to work processes and technologies.

What is the purpose of your company?

Efficient contract machining of complex cubic workpieces made of metal.

How did you earn your first money?

I worked in my father's business and then took over management.

What's your source of motivation?

The longing for the future and the will to successfully develop my company in the face of difficult situations.

What do you do now differently from five years ago?

We work every day on streamlining our processes and reducing costs.

Founded in
2000

23
employees

Jobshop machining of single milled and turned parts

When it comes to machining hardened steel and hard alloys, specialists today mainly think in terms of hard milling and hard turning. But to machine mould inserts, prototypes and replacement parts for special machines, EDM proves to be competitive in every respect because of its higher process security. This, at any rate, is the experience of contract manufacturer Lortz CNC Technik in Bamberg, Germany.

Rainer Lortz CNC-Technik

Where there's a will, there's a way.
Handling tricky machining tasks quickly and efficiently with wire-cutting.

With his team of currently 23 skilled machine operators, Rainer Lortz has specialised in cost-effectively producing single parts at short notice for the industry of the region around the town of Bamberg in Franconia. As he realised about

15 years ago, there is steady strong demand for prototypes and replacement parts for machines in the packaging, paper and printing industries. And makers of stamping tools regularly need prototypes and replacements for worn parts and

particularly for mould inserts. In addition, manufacturers of plant for renewable energy have prototypes and components, often of exotic materials, produced in small series by jobshops. In the search for suitable suppliers, the focus is on quality,



Rainer Lortz CNC-Technik

Makers of stamping tools need prototypes.



“The MV2400S wire-cutting machine is very quick to program and set up. My specialists can start setting up another machining process while the MV2400S is working dependably and unsupervised.”

Rainer Lortz
Managing Director
Rainer Lortz CNC-Technik

accuracy and above all speed of delivery. These requirements are met by Lortz with his workforce of skilled employees and a multitude of different technologies and machines. His full order books show that he has the edge over the competition. But until recently he was still short of an all-important technology that is particularly useful for the machining of hard and hardened alloys. Jobs that needed such treatment he therefore used to farm out to regional subcontractors. However, this often proved to be time-consuming and costly. What's more, it also severely limited his scope for offering tight delivery deadlines. That's why Lortz bought an MV2400S wire-cutting machine and an EA12-V Advance die-sinking machine from Mitsubishi Electric in the spring of 2013.

Flexibility thanks to high process security

As Lortz reports from his own experience, hard milling and hard turning aren't always as advantageous as they're made out to be today. "The

shorter machining time is offset by a more elaborate process. Hard milling as well as hard turning always have to be precisely attuned to the particular situation – workpiece geometry, clamping, machine and tool. In addition, a highly skilled machine operator has to monitor and control the process." This isn't really feasible when machining single items, particularly when tight delivery deadlines are involved. Each machining cycle then has to produce immaculate results at first go. "Electric discharge machining, on the other hand, is easier to program, straightforward to set up and, on state-of-the-art machines, yields an absolutely dependable process. This means that the otherwise unused but extremely inexpensive night hours and weekends can be put to productive use. The repeatedly cited drawback of longer machining times thus becomes irrelevant," says Lortz outlining his strategy. What counts is that he can reliably produce a fully functional precision component in a short space

of time. "The MV2400S wire-cutting machine is very quick to program and set up. My specialists can start setting up another machining process while the MV2400S is working dependably and unsupervised," Lortz adds. It thus runs more cost-effectively and much more flexibly than highly sensitive machines that have to be constantly monitored. This applies, for example, to components in which narrow, deep and very thin-walled grooves have to be cut. Mould inserts hardened to over 60 HRC are also preferably wire-cut.

Rapid integration of new technology

On purchasing the EDMs, Lortz's production team was initially confronted with an unfamiliar machining technology. But, as Lortz reports, two of his young employees quickly learned the ropes. "The intuitive operation and programming of the ADVANCE CNC control from Mitsubishi Electric was a big help in this. It was one of the main reasons why we finally chose Mitsubishi

Electric after comparing it with several machines from different manufacturers. What really stands out with Mitsubishi Electric is that the operation and programming interfaces on the wire-cutting and die-sinking machines are virtually identical," says Lortz in praise of the software ergonomics. The ADVANCE CNC control also has an integrated CAD system making it possible to enter 3D CAD data straight into the CNC control. At Lortz, the operators mainly do their programming at the machine in the workshop. The company also has a separate CAD system where workpiece data received from customers can be processed. As Lortz mentions, he is highly appreciative of the CAD system integrated in the ADVANCE CNC control which eliminates the need to buy a separate CAD/CAM system and the associated, annually recurring maintenance and servicing costs.

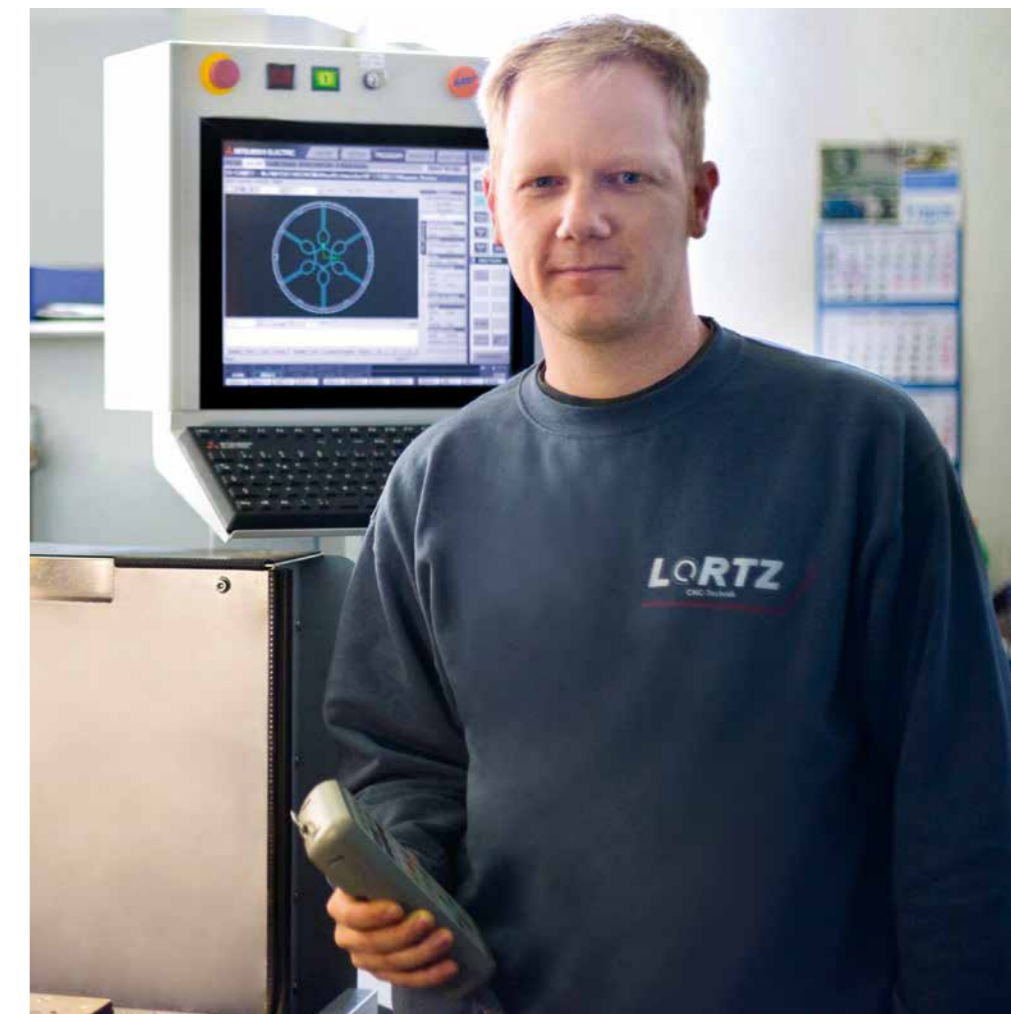
Precision beyond the call of duty

For the machining of hardened workpieces such as grippers and track guides for special machines or inserts for paper and plastic stamping tools, precision to the nearest hundredth and occasionally within five micrometres is demanded. On his 3D coordinate measuring machine, Lortz has seen for himself that wire-cutting on the MV2400S effortlessly achieves and usually exceeds this precision. The drive technology with the

So that the new technology goes quickly into operation, the ADVANCE PLUS CNC control guides the programmer and operator with graphically supported dialogues and makes tried-and-tested process parameters available from a knowledge database.

Tubular Shaft Motors, high-grade measuring systems and the process parameters integrated in the CNC control are responsible for this high precision. "In a series of 200 parts, the MV2400S dependably machined internal gears, for instance, to within about 3 µm. This was better than demanded and, as revealed by a comparison with gears machined elsewhere, much better than that achieved by the competition," says Lortz in commendation of the quality of his MV2400S from Mitsubishi Electric. A particularly helpful feature in his view is the process parameter da-

tabase drawing on over 40 years of EDM experience. It accelerates familiarisation with erosion technology, while the integrated, tried-and-tested process parameters quickly yield excellent machining results. On the basis of his initial experience, suitable process parameters are available for over 95 per cent of all machining tasks. "However, once a programmer and operator has acquired his own wire-cutting experience, he can of course modify and optimise the parameters to suit his own needs. This is how we build up our own process expertise in EDM technology on the job," Lortz adds.



Immaculate results at first go.



Rainer Lortz CNC-Technik



"By the time the competition has understood the drawing, our client has already received the fully machined part," says Rainer Lortz commenting on the flexibility and speed of his jobshop.

Economical and hence cost-effective

Contract manufacturers are under increasing pressure to cut costs. Customers are demanding extremely competitive pricing against a background of rising raw material, tool

and energy costs. Lortz can only confirm this trend. The constant rise in energy costs make a particularly big impression on his balance sheet, which is why energy efficiency is so important to him. This is where the quality features of the EDMs from Mitsubishi Electric are really welcome. The generator technology keeps power consumption within bounds and the filter cartridges are only replaced after long intervals. "Although we don't have a direct comparison with other machines, the MV2400S has demonstrated after only a few months that wire-cutting technology is very inexpensive in operation. What's more, it's possible to boost efficiency by suitably optimising the process parameters. This means, for instance, that we tend to process single parts at low cutting speeds. In doing so, we achieve the de-

manded precision and surface finish at first attempt and thus save a second cut. Expenditure on power and wire is reduced at the same time. The process takes a bit longer, but during unmanned operation overnight or at weekends this doesn't make any difference," says Lortz explaining his machining strategy. Summing up, he concludes that the EDMs from Mitsubishi Electric offer him every chance of staying competitive even when the going gets tough for businesses.

www.lortz-cnc.de



For single parts made of hardened steel containing penetrations with edges, deep grooves and internal gearing, wire-cutting proves to be dependable, precise and – as a result of machining during unsupervised night and weekend shifts – highly cost-effective.

Company profile

Rainer Lortz CNC-Technik

Rainer Lortz CNC-Technik
Rheinstrasse 3a
96052 Bamberg, Germany
Tel +49 951 917 769-0
Fax +49 951 917 769-35
info@lortz-cnc.de
www.lortz-cnc.de

Managing Director
Rainer Lortz

Core business
Jobshop machining of single milled and turned parts

Employees
23

Founding year
2000

Interview



Rainer Lortz
Managing Director

How would you describe in a sentence what your company does?

We solve problems quickly.

How did you earn your first money?

As an apprentice at a lathe.

What's your source of motivation?

Our motto: "Where there's a will, there's a way."

What do you do now differently from five years ago?

I analyse the market and the business environment, compare outlay, costs and earnings, and precisely estimate the cost of each job.

Where do you see your company in five years' time?

We will be better prepared for fluctuations in the economic climate by serving a greater diversity of customer sectors and by integrating new technologies in our production activities.

What was your biggest business success?

I've managed to build up a successful team of skilled employees who accept a large degree of responsibility for delivery deadlines and quality.

What's your favourite way to relax?

I like going out on leisurely tours on my classic motorbike and I also enjoy Alpine skiing.

What attributes to you value most in others?

Honesty and dependability.

What faults in others do you find easiest to forgive?

Minor errors of oversight.

If you were asked what your company does by a friend with no technical knowledge, how would you explain it in a sentence?

We produce components that are urgently needed in industry at short notice.

How do you practise energy efficiency on a daily basis?

We're constantly coming up with ideas for in some cases unusual machining solutions in order to minimise costs.



Rainer Lortz CNC-Technik

Integrated and proven process parameters.

Founded in
1963

12
employees

Development and production of precision casting dies and injection moulds



A fighting-fit team!
Teamwork is writ large at
Seehafer & Marohn.

Immaculate steel dies and moulds for the production of high-grade die castings and injection mouldings call for machines that perform outstandingly. By purchasing an MV2400R wire-cutting machine from Mitsubishi Electric, Seehafer & Marohn are responding to the higher standards of precision, quality, punctuality, accurate fit, contour-trueness and flexibility expected by customers. They benefit from high productivity and lower piece costs combined with faster throughput and delivery.

Seehafer & Marohn Stahlformenbau

Immaculate steel moulds for perfect-fit closure systems.

A task for innovative EDMs.

Seehafer & Marohn GmbH & Co. KG in the “locks & fittings” town of Velbert has been synonymous with precision die and mould making for over 50 years. It sees its challenge in satisfying customer demand for steel dies and moulds with an outstanding surface finish and high precision. For this, Seehafer & Marohn makes use of modern EDM technology. On a surface area of

1200 square metres, the company with its twelve employees makes precision steel casting dies and injection moulds for the production of technically sophisticated items. There are a lot of benefits to using these steel dies and moulds made of robust, high-alloy tool steel in mass production: low material loss, constant product quality in the long term and rapid production cycles.



Customers benefit from high productivity.

The die casting process produces items made of zinc or aluminium, for example, while injection moulding is used for plastics. The range of products also includes cylinders and lock systems resulting from the fact that the “key region of Velbert” has been home to companies of the locks & fittings industry for centuries. In addition, the maker of dies and moulds has also established itself with door handles and trim parts for the automotive industry. The orders mainly come from systems suppliers, most of which operate globally. And this means that steel dies and moulds from Seehafer & Marohn are even used in China. With the production of moulds for electrical housings, the company has extended its clientele into the electrical industry. For the production of high-quality prototypes, the company also machines sample dies and moulds.

“We’re not so big that administrative duties hamper our flexibility and innovation, but big enough to satisfy the needs of our customers at any time,” explains Dipl.-Wirt. Ing. (FH) Klaus Marohn, a graduate in engineering management. He and his brother Frank are the Managing Partners of Seehafer & Marohn in the second generation. The sectors they serve demand dies and moulds exhibiting high precision, parallelism, surface finish, exact contours and defined taper. The dies and moulds must also ensure high process security so that they contribute to a long service life in parts production. Deadline compliance and a quick response are also necessary and are important for repair jobs so that machine downtime in customer production processes can be kept to a minimum. Some customers also request the advance stocking of spare parts. As in one special instance, this makes it possible to supply spare parts that fit first

External door handle – an example of a final product for the automotive sector.

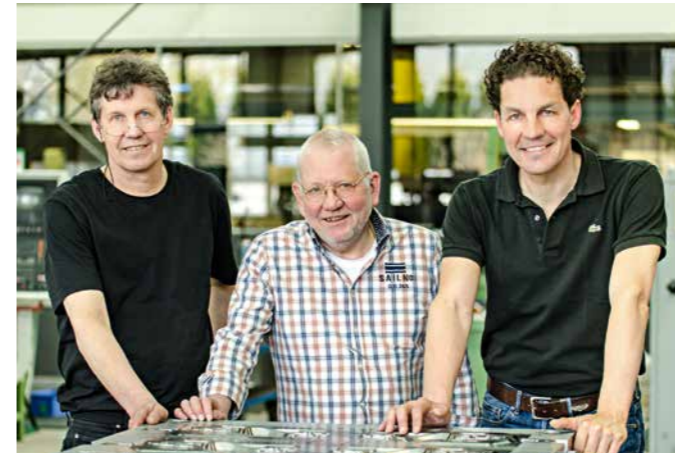


time, even after seven years. Against this background, all-round service enjoys high priority, extending from initial consultations and production through to maintenance and servicing of the dies and moulds. To produce steel dies and moulds with the required characteristics, wire-cut EDM technology is essential. This exceptionally precise cutting method is ideal for the machining of the hardest steels, with the cut edges meeting the highest standards of accuracy in terms of shape and dimensions.

An unscheduled but safe investment

“In October 2014 we were faced with the situation of having to extend our machine park at short notice. This new investment became necessary because an older machine from a different manufacturer had a serious malfunction and we were under pressure to complete our orders on time. The new machine is the MV2400R wire-cut EDM from Mitsubishi Electric. This marked a big step into the high-end bracket. The new machine has a whole range of interesting improvements and novelties,” Klaus Marohn reports. “We’re very open to innovation, but investing in an inappropriate machine could be problematical for a business of our size. We have always attached importance to new but proven technology that meets our needs at least into the medium term. All the same, this new investment was not exactly a step into the unknown as we had been using an FA20-S Advance wire EDM from Mitsubishi Electric since 2008. We had had very positive experience with this model in terms of quality, precision and reliability. Only rarely did we have to resort to the service hotline and we always got professional support.”

The investment helped to further streamline the machine park. A big advantage is that the operating strategy of the new machine is largely identical to that of the FA20-S. Before order placement, an employee of Seehafer & Marohn put a demonstration machine to exhaustive testing at Mitsubishi Electric in Ratingen. Intuitively, he was able to operate the machine without any difficulty, and this eliminated the need for any formal training. The new machine comes with a whole range of innovative technologies that offer scope for economies and, with a large diversity of functions, permit the machining of dies and moulds with increasingly



This marked a big step into the high-end bracket.

complex geometries. In addition, the basic package includes virtually all extras, and the excellent price-performance ratio offers the prospect of rapid amortisation. The new machine was delivered on Friday, 24 October, set up and commissioned the next Monday by a Mitsubishi Electric fitter. The first work on the MV2400R was then carried out on the Tuesday.

Innovative features for comfort and efficiency

With its Natural User Interface (NUI), Mitsubishi Electric has again improved operating comfort over that of the predecessor model. Intuitive operation is very straightforward with the aid of input masks and symbols. Workpiece set-up is performed with the aid of logically structured 3D views on the machine’s 15" touchscreen. The Easy Set Up instructions unite all the main settings on a single screen. Furthermore, through measurement of the workpiece surface with a dial indicator, the wire’s angle of inclination can be automatically compensated for and adapted to the precise workpiece length. “Malfunctions are displayed immediately in messages on the monitor. In an extra window, the operator is given a problem analysis and instructions for remedial action. In addition, for complicated applications, he can check all the machining steps in 3D on the monitor,” says Lothar Dördelmann, in charge of production at Seehafer & Marohn. “The working range of the MV2400R enables us to machine workpieces from the size of a matchstick to dimensions of 1050 x 820 x 305 mm with a maximum weight of 1500 kg.”

“On the new machine, we’ve found that machining speed is up to 30 per cent higher for standard applications. This is of great importance for us – not only for the handling of run-of-the-mill jobs, but particularly for the rapid processing of urgent jobs and in cases of repairs,” says Klaus Marohn. “The new Tubular Shaft Motor drive concept goes a long way towards improving workpiece quality.” This is an ideal solution for adapted and totally cogging-free motions of the axes by means of magnet motors. Motions and positioning can be sensitively controlled. This results among other things in precise wire guidance with clean cuts, even on challenging tapers.

Dependable automatic wire threader

“We’re delighted with the new automatic Intelligent AT wire threader. This technology has had a lasting effect on working efficiency, whether we use 0.2 or 0.25 mm wire. After wire breakage, be it submerged in the tank, in the kerf or after interruptions in start-hole drilling, wire threading is performed reliably, swiftly and with great precision. We used to have to guide the wire back to the insertion point and thread it all the way through again,” Dördelmann explains. “So we’ve gone over to setting up



There are practically no limits to component dimensions. Here we can see a key shank core for a car key.



workpieces in the afternoon or evening that can be machined on the MV2400R overnight. The machine will run without supervision, so we save a lot of time, use less wire and boost productivity noticeably." So that they're always aware of the state of progress at night, at weekends and on public holidays, Seehafer & Marohn have optionally invested in the mcAnywhere Contact function. The EDM automatically relays status messages in the form of standardised text messages to various freely definable mobile phone numbers.

If a workpiece doesn't take all night to machine, energy is saved until work is resumed. Because, thanks to the new generator technology, when the workpiece is finished, the machine shuts down all stand-by systems into sleep mode. The activation of this mode results in a dramatic reduction in energy consumption and supplements the already generally achievable energy savings possible as a result of the innovative strategy of the MV Series from Mitsubishi Electric. Also worth mentioning in this connection are the savings of cutting wire, deionising resin and filter cartridges over the FA20-S Advance. The same quantity of eroded material is achieved with a significant reduction in operating costs, which has a beneficial effect on resources and the environment.

"If we're to give our provisional verdict, we can say that we're very happy with the quality, precision and machining time in the machining of steel dies and moulds for the production of our customers' intricate die castings and injection mouldings. The positive feedback from our customers confirms our assessment. Thanks to the outstanding performance of the wire-cutting machine, its huge range of functions and flexibility in use, we achieve considerable savings. With a marked reduction in operating costs, improved competitiveness and its outstanding price-performance ratio, we expect the machine to pay for itself in a relatively short time," says Klaus Marohn summing up. "We are certain that the dies and moulds for the automotive and electrical industries will continue to become more complex and geometrically intricate. And the production technology and capacity of the innovative MV2400R put us in an excellent position to deal with this."

www.seehafer-marohn.de

Company site of Seehafer & Marohn GmbH & Co. KG in Velbert



Company profile

Seehafer & Marohn Stahlformenbau

**Seehafer & Marohn
Stahlformenbau GmbH & Co. KG**
Eickheisterstrasse 6
42551 Velbert, Germany
Tel +49 2051 228 17
Fax +49 2051 221 17
info@seehafer-marohn.de
www.seehafer-marohn.de

Owners
Dipl.-Wirt. Ing. (FH) Klaus Marohn
Industrial Master Craftsman Frank
Marohn

Employees
12

Founding year
1963

Core business
Development and production of precision casting dies and injection moulds

Interview



Klaus Marohn
Managing Director

How did you earn your first money?

During my schooldays I had the chance to wash the cars of our staff for DM 5.

What makes your company successful?

Our longstanding team of skilled employees whom we can rely on 100 per cent.

What you like most about your job?

The freedom to take business decisions myself, the high flexibility of a modestly sized company and the direct contact with my employees.

What do you see as your biggest challenges?

For us, the biggest challenge is dealing with our customers' specific jobs on a daily basis. In doing

so we pursue the goal of finding the optimum solution and achieving the desired quality in the given time for the agreed price – and all this in competition on a global market.

What is your biggest strength?

Achieving the set goals and staying human at the same time.

How do others impress you most?

With honesty, reliability, technical competence and creativity.

How do you recharge your batteries in your free time?

I do a lot of sport – rowing, jogging or skiing in winter – to clear my head and stay physically fit.



Seehafer & Marohn Stahlformenbau

Significant reduction in operating costs.

User

horoscope.

Capricorn

22.12.–20.01.

You're in desperate need of a holiday. You know you are when a glance at the water tank of your wire EDM starts you day-dreaming of the sea, sand and sun. Take a week or two off and book yourself a relaxing bathing or wellness holiday. Afterwards, with your batteries recharged, you'll be back to the accustomed quality of surface finish.



Aquarius

21.01.–19.02.

Your efforts have been crowned with success. You really are a live wire! Have you modelled yourself on the threading technology of the MV? Your wishes come true as automatically as the wire is threaded on your machine. You hardly need to do anything, for everything just comes to you. Enjoy this state of affairs and make sure that your good fortune stays with you in future as well.



Pisces

20.02.–20.03.

The stars point to challenges coming your way. You battle with rough surfaces and embrittlement, and not only when wire-cutting. A person close to you demands extra attention and compassionate treatment. Make a special effort, because you can then look forward again to clean, shiny surfaces.



Cancer

22.06.–22.07.

You've really mastered the art of EDM, that's for certain. You work with the same precision as your machine. But are you as dependable in other areas as? Don't neglect your private life, and allow time for yourself and your loved ones. For they're at least as important as wire-cutting and die-sinking.



Leo

23.07.–23.08.

Thanks to Venus, you can expect the sparks to fly – and not only due to electric discharge. With your irresistible aura, you can look forward to a few promising weeks of romance. Make the most of your good fortune! Your NA2400 can get along for a few hours without you.



Virgo

24.08.–23.09.

Your reserves of strength seem simply inexhaustible. You're constantly on the go. Your performance is in no way inferior to that of an FP120V generator during roughing. But don't burn yourself out. Because, even if it might feel like it, you're not quite in the same league as a die-sinker of the EA-V Advance Series.



Aries

21.03.–20.04.

You're unstoppable – you've got as much drive as a Tubular Shaft Motor. Your practically cogging-free motion is admired by all – as is your unbeatable efficiency. Take advantage of this surge of activity and wire-cut for all you're worth. Finish off things that you've been putting off for along time. Look to Jupiter for the energy you need so that you can go from strength to strength.



Taurus

21.04.–21.05

You are just as delighted with the user-friendliness of your EDM as the people around you are with your easy-going nature. You make it easy for others to like you. During the coming New Moon phases, you are even more laid-back and relaxed than usual. And your workmates appreciate you both as an experienced EDM specialist and as a person.



Gemini

22.05.–21.06.

Mars gives you a major boost to your performance. At the moment, you've got as much staying power as your EDM and you relish your increased productivity. Unscheduled stoppages are not expected for the time being. Our advice to you: make use of this burst of energy not only at work but also at home.



Libra

24.09.–23.10.

Thanks to Saturn, your finances take a turn for the better and the money pours in. But think carefully about what to do with the unexpected windfall. Obviously, it's tempting to invest in a new EDM. But precisely cut workpieces with a superlative surface finish are not the only thing in life. So why not splash out on yourself or someone close to you?



Scorpio

24.10.–22.11.

You often feel whacked and washed out. During start-hole drilling, you're hampered by electrode wear. But is it the material? Or is it you? You don't need to compete with the drilling speed of an ED-24. So shift down a gear from time to time and give yourself a break. Otherwise you'll soon notice the first signs of wear on yourself.



Sagittarius

23.11.–21.12.

As an experienced wire-cutter, you're capable of operating your machine with your eyes closed and still achieving consistently good erosion results. But at home, you're beset with worries and problems. But there's really no reason for this. Life simply isn't as easy to control as a wire-cutting machine. You'll soon see that everything comes good in the end. And if it doesn't, it isn't the end.

