EMO Hannover
A 360 degree view
Mitsubishi Electric Europe

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You’ve missed one of our issues? No problem!
Ordering back issues and change of address
Editorial

Plenty going on at EMO

One of the biggest crowd-pullers was the fully automated production cell, which operates dependably unmanned. (Page 09)

For many users, smooth operations depend on a wire threader that simply does what it’s supposed to, even on difficult workpieces. An FA20 at HellermannTyton Engineering runs for about 40 hours without an operator. (Page 08)

The Micro Vibe 300 developed by IMM (soon to be a Fraunhofer Institute) promises 70 per cent time savings during die-sinking EDM. (Page 11)

There were so many highlights that it is hard to choose the best ones for you. The first oil-based wire-cut erosion machine with tubular direct drive – an assurance of high-precision machining in the long term – celebrated its world premiere.

Thumb through this issue, experience the EMO highlights on the coming pages and find out what’s new. The next EMO is taking place in Milan in 2015 with the motto “Let’s build the future”. But we don’t need to wait until then.

Best regards from Ratingen

Hans-Jürgen Pelzers
Distribution Manager Europe

Legal notice

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No responsibility is taken for the accuracy of technical data and information in articles.
Managing Director Jörg Lünstedt and his wife Karen from LÜNTECH Erodiertechnik GmbH in Werther, Westphalia were among the visitors to the Mitsubishi Electric stand at EMO 2013 in Hannover. For Jörg Lünstedt it was important to stress the great service and diversity of machines at the stand. In a sweeping gesture towards the stand, he summed up his enthusiasm: “What I like is that Mitsubishi shows nothing but machines in action. You see things in motion. I also like the friendly atmosphere. I feel well looked-after and thoroughly welcome.” LÜNTECH is a jobshop for tool- and mouldmakers that operates with six wire EDM machines from Mitsubishi Electric. “Our experience with them has been nothing but positive. This also applies to Mitsubishi’s service capability,” Karen Lünstedt stresses. “And when we officially opened our new plant shop at our in-house show in July 2013, Mitsubishi was there and demonstrated our equally new MV2400R.”

Visitors thronged around the exhibits, and all the tables for meetings were occupied. Visitors from all over the world and advisers from Mitsubishi Electric put their heads together and talked shop. At the company’s EMO fair stand, the big issues were new machines, automation solutions and, above all, cultivating contacts. Alongside all this, there was always enough time for a cup of freshly brewed coffee or for a snack. Or for a beer.

MITSUBISHI ELECTRIC

With so much to see, visitors flocked to the Mitsubishi Electric fair stand.
new MV series is meeting with big customer interest in general. Thomas Schlemmbach, Production Manager at AWEBA Werkzeugbau GmbH, Aue, reported that he bought three MV1200R machines in 2013. The reason was to boost capacity. “We bought the machines virtually on the spur of the moment. We needed the machines from one moment to the next and Mitsubishi supplied them promptly.” Schlemmbach leaned back contentedly in his chair. “Without the MV1200R we’d never have managed the work in hand. We expect it to run for at least 500 hours per month.” Before making its decision, AWEBA conducted extensive tests, some of them with rival machines. Mitsubishi was the only company able to deliver the desired quality within the demanded short space of time.”

Holger Rose, Technical Toolshop Manager at HellermannTyton Engineering GmbH in Tornesch, made a scheduled investment at the Mitsubishi Electric fair stand. The manufacturer of components for injection moulds was interested in purchasing a wire-cut erosion machine. “We’ll probably go for an FA30-S Advance V although a machine from the MV series is also under consideration.” Rose revealed, sipping his mineral water. “We’ve been working with an FA20 for years and are very impressed by it – the same can be said for Mitsubishi’s technical advice.” The decisive features when choosing a machine, he believed, are the automatic wire-threading system and the possibility of running the machine at night unmanned. As far as the latter was concerned, his experience with the FA20, which operates for about 40 hours without an operator, had been very good. The new machine, he claimed, was an absolute must for capacity reasons. And he was also planning to replace an old machine from a different supplier. In the medium term, HellermannTyton would probably switch entirely to wire EDM systems from Mitsubishi Electric.

Silvio Wendler from Fresenius Kabi Deutschland GmbH in Bad Homburg also intended to buy a wire erosion system. He said he had come to EMO to look at the MV2400R. Because of its high precision, he needed this machine among other things for the production of infusion components for the medical technology sector. He was also considering buying an ED24-NC start hole drilling machine. In addition, he was interested in general in new products and wanted to intensify his contacts with Mitsubishi Electric. “For the latest investment, the decision has been taken in favour of Mitsubishi Electric,” Wendler explained over a cup of coffee. “There are several reasons for this. Firstly, I like what the company offers in terms of service and training. And secondly, the selected machine is technically in line with our future plans.” He said the fully automated production cell met with lively interest from visitors.

At the Mitsubishi Electric fair stand, there were live demonstrations of many technical innovations.

The Mitsubishi Electric team was delighted by the many interested visitors and provided an inviting and relaxed atmosphere.

Jörg Lünstedt and his wife Karen from LÜNTECH Erodier-technik GmbH in Werther were among the visitors to the fair stand.
he had already been in contact with Mitsubishi Electric for some time for ac-
cessories. And this is how he had gained confidence in the company.

Making use of ideas from cooperation partners

At EMO, Dipl.-Ing. Harald Bader, Managing Director of HBl Robotics GmbH, Gosheim, a Mitsubishi Electric cooperation partner, showed how dia-
mond-coated grinding wheels can be dressed (= profiled and sharpened) by wire erosion. He explained the process
to visitors at the production cell. “The visitor interest, Bader named other
advantages for the customer: set-up time at the grinding machine is reduced
and the user can produce or dress his grinding wheels himself. Dipl.-Ing.
Jochen Hipp, Managing Partner of ITS-
Technologies GmbH & Co. KG, Oberndorf
am
Neckar, also supported Mitsubishi
Electric as a partner at EMO. At the pro-
duction cell, he demonstrated how easy
it is to clamp grinding wheels. "We are
suppliers of supplementary axes and made a B-axis available on which the
wheels rotate for dressing." Hipp also
mentioned the benefits to the user. For
the customer, the system’s flexibility is
useful, particularly if ready-to-use grind-
ing discs are needed at short notice. In
addition, he continued, the process en-
ables EDM jobs shops to produce grind-
ing wheels for specialist grinders and improves process security in the down-
stream production steps.

Another cooperation partner present
at the fair stand was Institut für Mikrotechnik Mainz GmbH (IMM),
Mainz, which demonstrated micro-
machining with wire-cut and die-sinking erosion.

According to Dipl.-Ing. Frank Neumann,
Head of the Precision Engineering
Department, IMM tests machines for
them in our software. The operator benefits from this, because he doesn’t
have to search for a solution on the market. Good partnership is also im-
portant so that tests can be carried out – in terms of the use of additional
axes, for example.”

Another development of IMM, soon to
become a Fraunhofer institute, is the
Micro Vibe 300 vibration unit for use
during die-sinking EDM, which achieves
time savings of 70 per cent.

A look ahead

What would a fair stand be without a
look ahead? To expectant visitors,
Mitsubishi Electric raised the curtain on
the world’s first oil-based wire-cut EDM
system with tubular direct drives. The
MX600 wire-cut erosion machine which
celebrated its world premiere at EMO
is synonymous with superfine sur-
faces and the machining of corrosive
materials with very high long-term pre-
cision rounded off Mitsubishi Electric’s
trade fair showing.

“Thanks to Christian Lenz, Indirect Sales, DCAM GmbH, Berlin, the subject
of programming was also represented at the Mitsubishi Electric fair stand.

“It was difficult for me to answer the question of what a fair stand is without
a look ahead? Thanks to cooperation with Mitsubishi, we are in a
position to respond at short notice to new technologies and integrate
them in our software. The operator benefits from this, because he doesn’t
have to search for a solution on the market. Good partnership is also im-
portant so that tests can be carried out – in terms of the use of additional
axes, for example.”

www.mitsubishi-edm.de
Mr Pelzers, what expectations do you have from attending the trade fair?

Pelzers: We at Mitsubishi Electric have taken part in EMO 2013 in order to meet new potential customers and introduce them to our technologies. It is not our sole aim to sell as many machines as possible here. We want to lay the foundations for future business.

How has business been so far?

Pelzers: Today, on the third day of the fair, we’ve pulled out all the stops, had interesting meetings, discussed new projects and picked up our first orders. It’s been really great fun!

To what extent have your expectations been confirmed so far?

Pelzers: We’re satisfied. The cautious
Trade fair facts:
EMO Hannover –
The world of metalworking

Name and seat of the fair:
EMO (Exposition Mondiale de la Machine Outil) Hannover, Germany

Fair premiere:
1975 in Paris, France

Organiser:
Verein Deutscher Werkzeugmaschinenfabriken e.V. (German Machine Tool Builders’ Association) (VDW), Frankfurt am Main, Germany

Chairman:
Martin Kapp, Coburg, Germany

Spectrum:
World’s biggest metalworking fair

Visitor figures:
142,804 trade fair visitors overall in 2013

EMO Hannover is the undisputed flagship fair for the sector. It is the only one to reach the globalised markets all over the world – and this in the heart of Germany, one of the most important customer countries.

Exhibitors come to EMO Hannover from all over the world and from all fields of metalworking. With roughly 60 per cent of its exhibitors coming from abroad, EMO Hannover is the most international trade fair for metalworking worldwide. The innovation potential for productivity and efficiency that visitors expect is beyond compare. This is well known and acknowledged in the trade world and makes EMO Hannover the mecca for top-level suppliers and users. Visitor internationality reflects this.

EMO Hannover’s exhibitors have long attuned their innovation cycles to the world’s leading metalworking fair. This means that more innovations are unveiled here than at any other trade fair in the sector – which in turn makes EMO Hannover a key point of reference for decision-makers in the production technology segment.

EMO Hannover presents an unparalleled breadth and depth of products and services throughout all production areas. These cover everything from machine tools and production systems for cutting and forming as the nucleus of machining via precision tools, accessories and control technology to system elements and components for automated manufacturing plus process linking systems and industrial electronics. This attracts the whole spectrum of user industries to Hannover.

The technical quality and decision-making competence of visitors to EMO Hannover is unsurpassed. This is due to the innovation potential for productivity and efficiency that awaits them at the fair. EMO Hannover is where top-flight suppliers and users meet.

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expectations that we had were realistic and have been fulfilled.

And how have visitors reacted to the fair stand?

Pelzers: Entirely positively. We’re showing what matters. In addition, visitors have the chance to sit down in a bright environment – this makes a good impression. We invite them to spend time among themselves and with us.

On the principle of “people for people”.

How important is EMO as a trade fair?

Pelzers: Attending EMO is absolutely essential although it is not the most important trade fair for us in Europe. AMB in Stuttgart is more important for us today. But our participation at EMO has also generated a large number of new projects.

www.mitsubishi-edm.de

We’re showing what matters. In addition, visitors have the chance to sit down in a bright environment – this makes a good impression.»
By investing in an MV2400R Grand Tubular from Mitsubishi Electric, Werkzeugbau Kröger has taken huge a step forward in terms of productivity and efficiency. A step that reveals itself among other things in shorter machining times and lower energy consumption.

Hans-Jürgen Kröger strides forth. The Managing Director of Werkzeugbau Kröger GmbH, Lohne (Oldenburg), is on his way to his new wire EDM machine. “Mouldmaking is becoming more and more challenging. And we have to stay competitive with the Asian market. We can do this best by satisfying our customers. They have high expectations and demand precision and high surface quality at an affordable price.”

Werkzeugbau Kröger, a toolshop founded in 1998, mainly serves plastic parts manufacturers and automotive component suppliers in Germany. A currently 24-strong team attends to customer needs. Special requests are by no means out of the question, the owner stresses. What Kröger means by quality workmanship is demonstrated by Production Manager Jörg Fangmann who presents a contoured insert for the ejector side of an injection mould that they produce for the agricultural industry. “The production of technically sophisticated injection moulds is one of our specialities. For this component, we produced the holes on the wire-cut erosion machine. The sizes of parts that we machine on the MV2400R extend from small to the machine’s maximum work space dimensions.” Kröger underlines this statement by placing a minuscule component, a slide guide, next to it. “Here you can clearly see the contoured areas that we wire-cut on the injection mould components.”

Technologically the best machine on the market

The mouldmakers in Lohne produce parts for series production, development work, testing and the 2-component EDM and more
sector using heat-treatable steels. The company also carries out repairs, produces testing tools and modifies moulds. As an example, he lifts a long, thin element produced on a machine of the MV series.

Fangmann clamps a workpiece in the MV2400R Grand Tubular, which is known for its higher machining speed, reliability, energy savings and for corner and circular accuracy. “The machine threads the wire much more speedily and neatly. And in the cutting gap as well, which we also attach great importance to. This used not to be possible.”

The reasons why the MV2400R Grand Tubular cuts appreciably faster and more precisely can be found in the modern drive strategy with Tubular Shaft motors that ensure totally cogging-free movements that can be controlled with great sensitivity. And also in its totally digital ADVANCE PLUS CNC control and its Optical Drive System in which an optical network handles data interchange. Apart from this, the machine has fewer wear parts, to some extent because it does without spindles.

High performance in economy mode

Kröger leafs through his papers. “According to Mitsubishi, the MV2400R Grand Tubular is capable of reducing machining time by up to 17 per cent. For us, the step has been even bigger. This is because we changed to the MV series not from the predecessor model, but from the FX20. This means that we’ve leaptfrogged several machine generations in one go.” The operating costs reveal that this performance boost is achievable in economy mode. Mitsubishi Electric has thus reduced energy consumption by as much as 69 per cent over the previous series.

For Kröger this is another positive feature: “In view of the sharp increase in energy costs, this is a considerable advantage.” Then there are savings on filter cartridges and ion exchange solutions. And wire consumption up to 45 per cent lower than on conventional wire EDM machines thanks to optimised wire running speeds.

All in all, Werkzeugbau Kröger benefits from significantly lower hourly machine rates and from the resultant higher cost-effectiveness. These are points that can be decisive for an investment on top of the already attractive price/performance ratio of the MV2400R Grand Tubular.

Fangmann stands at the console of the ADVANCE PLUS CNC. “Our CAD data...
are imported straight from the control. And this control is much more straightforward and intuitive to operate than the previous one. In addition, once he has fed the machine with data, he can let the machine run unmanned at night. And he can sleep peacefully because the toolmakers have had the optional mcAnywhere Contact function installed so that the system texts critical status messages to a defined mobile phone number.

A worthwhile investment

Kröger points to sample parts that have been cut on the MV2400R Grand Tubular and are now in a showcase. “On the basis of my experience to date, the investment in the MV2400R Grand Tubular has paid off. We’ve been able to confirm the practical improvements in efficiency promised by Mitsubishi and the machine has even surpassed our expectations on a number of counts – in terms of short machining times, quick and precise wire-threading, energy efficiency and ease of operation. I expect the machine to have paid for itself within eight years.”

www.werkzeugbau-kroeger.de

www.werkzeugbau-kroeger.de

» The MV2400R is technologically the best machine on the market at the moment. «

It is very important for Werkzeugbau Kröger that the MV2400R Grand Tubular threads more speedily and neatly.

Name and place of company:
Kröger Werkzeugbau GmbH, Lohne, Germany

Founding year:
1998

Managing Director:
Hans-Jürgen Kröger

Number of employees:
24

Core business:
Making injection moulds

www.werkzeugbau-kroeger.de

How would you describe in a sentence what your company does? We produce injection moulds.

How did you earn your first money? As a toolmaker.

What motivates you? Keeping up with the state of the technology.

What’s different about how you do things now, compared to five years ago? We’re much more modern and respond more closely to customer wishes.

Where do you see your company in five years’ time? I’d like to extend our technical offering.

What was your biggest business success? Building up the business myself.

What’s your favourite way to relax? When I can get complete peace and quiet.

What attributes do you value most in other people? Honesty and good cooperation.

What failings in others do you find easiest to forgive? Ignorance.

If you were asked what you do by a friend with no technical knowledge, how would you explain your work in a single sentence? We cut metal in the same way as school kids cut polystyrene with wire.
NEWPORT TOOLMAKERS

At full speed into the future

Newport Toolmakers Ltd has taken delivery of a Mitsubishi MV2400S CNC wire EDM featuring revolutionary cylindrical drive technology. Supplied by exclusive UK distributor, HK Technologies, the machine has been set to work producing press tool punch and die sets, largely for the automotive industry.

Owned by two directors with more than 40 years’ experience in the toolmaking industry, Kevin Brewer and John Nicol, Newport Toolmakers began life in 1995 in a small unit at Newport Pagnell, Buckinghamshire. Acquiring basic machinery the company grew rapidly in its first two years until, to keep pace with new technology and techniques, Newport Toolmakers decided that additional machinery was required. This resulted in the need for more space and a move to the company’s current 3000 sq ft premises in Bletchley near Milton Keynes. That was in 1997 and today the philosophy of ongoing investment continues at this progressive toolmaking enterprise, where core business centres on high quality press tools, diecast tools, assembly jigs, fixings and checking fixtures. The company can also provide a comprehensive tool refurbishment service.

Wire erosion is one of the core manufacturing processes at Newport Toolmakers as this facilitates the generation of extremely detailed and precise tools. Until recently, the company was running a pair of Mitsubishi wire EDM machines that, although reliable, were reaching the end of their working life.

Impressive performance

“We have no complaints with the performance of our Mitsubishi machines over the years, and while they were still producing accurate parts, we realised there was an opportunity to take advantage of next generation technology,” says Mr Nicol. “I admit to having a look at one or two alternatives to Mitsubishi, but when I saw the new MV Series I was really impressed.”

The MV Series of wire cut machines feature a host of game-changing engineering improvements, many of which are industry firsts. Arguably the most significant is the revolutionary cylindrical drive technology, which Mitsubishi EDM says removes many of the pitfalls associated with linear drive motors.

At the core of this breakthrough are innovative tubular shaft motors that move a number of axes. These motors prevent ‘cogging’ and ensure smooth and highly controllable movements.
Quality pays off

“We have an excellent reputation for supplying the highest quality press tools to manufacturers ranging from small businesses in the electrical and plastics industry, through to large international automotive companies,” says Mr Nicol. “Quality is paramount because predominately our work is bespoke toolmaking, whether die cast tools, pierce and blank tools, form tools, progression tools or compound tools. This investment in new machinery means we are now one of the most comprehensive toolrooms in the area in terms of capability and quality.”

**Endless possibilities and precision to perfection**

Quality is further enhanced using the new MV Series via integrated functions such as DDS (Optical Drive System), which deploys fibre optic communications between the control unit, servo amplifier and linear motor to improve machining accuracy (±2µm) and provide reaction times up to four times faster than electrical cable. Productivity is also boosted by the PFC (Precise Finish Circuit), which is able to generate finishes up to 30% finer than previous generation models with less skim cuts.

**Higher speed with with fewer skim**

“As well as offering enhanced quality I would say our new Mitsubishi MV2400S is at least 50% faster than the models we replaced,” says Mr Nicol. “Despite being of far higher specification than the machines it replaced, installing the Mitsubishi MV2400S hasn’t required any sort of learning curve,” says Mr Nicol. “Overall the whole acquisition, commissioning and training process was very straightforward. HK delivered everything we needed and the machine is already providing differentiation against our competitors.”

“Quality is really like the wire saving functionality.”

For quicker and more continuous operation, Mitsubishi EDM has also enhanced its Intelligent AT automatic wire threading system, which operates reliably and quickly, not only when rethreading a submerged hole but also when threading the cutting gap or discontinued initial holes. What’s more, the Digital Matrix Sensor and V350 generator digitally shape the pulse to decrease wire vibration and minimise electrode wear, reducing wire consumption by 46%. “We really like the wire saving functionality,” he adds. “Low operating costs are vital to small businesses like ours, particularly considering the price of brass wire these days.” The Mitsubishi MV2400S at Newport Toolmakers is configured with a two-axis (XY) linear shaft motor and a three-piece, U-shaped hardened table. It can accommodate parts up to 1050 x 820 x 305mm. MK2400S in operation.

**www.newport-toolmakers.co.uk**
In fact, anyone who has ever looked at a bonsai nurtured by a master knows that we are talking here about more than just a tree. Because the moss growing at the foot of the miniature tree, stones that look they’ve been shoved here by a landslide and even figures can contribute to the overall arrangement.

Decorative skills and precision are required

If you look at it like this, artists and designers can really go the whole hog on a bonsai. Some of the little trees have a single trunk, while others come in twos and threes. A bonsai can stand by itself or form a glade or short avenue. You are free to do as you please – a tree in a bowl can blend in with the rest of the interior decoration. For instance, by placing it on an Asian cabinet, in front of illustrated scrolls with matching motifs or in front of a screen adorned with Oriental stylistic elements.

On the subject of bowls, the container is capable of contributing a great deal to the overall work. Some have plain rectangular or oval shapes so that they do not divert attention from the central feature, the tree itself. The bowl itself, however, can also be very striking, have zigzag edges, or a bonsai, a popular stylistic feature, can appear to grow out of a stone. In the film “Karate Kid”, in which caretaker Mr Miyagi (alias Noriyuki “Pat” Morita) teaches his hothead novice not only the martial art of karate, but also self-control, composure and the precise use of the bonsai shears, we learn that the care and pruning of a bonsai, at least in the Far East, is an almost meditative act. At the same time, bonsai gardeners, however regimented the treatment of these miniature trees may appear to be, are relative free in their choice of vegetation for potted cultivation. Pines are popular, although juniper and European larch are also worthy of consideration.

Naturally flowering trees are particularly impressive. You can thus find bonsai azaleas. At the same time, maple, various elms and the Japanese apricot can be fashioned into attractive miniatures. Today, most of these plants come from seeds and

Well-tended, a bonsai can be passed on to one’s children and from them to one’s grandchildren.
cuttings, although digging up bizarrely shaped trees in the wild is still very popular, especially in Asia.

**Modelled on nature**

Of course, any would-be bonsai grower should take pains not to let his love of creative pruning run away with him. Because even if the fukinagashi, a crooked tree with its branches and foliage blasted and dishevelled by mountain gales, or the nebari, a bonsai with exposed and visible roots, are legitimate and popular stylistic features, the natural shape of the tree should never be lost. In other words, whether a group of trees or glade around a central tree is imitated, whether the bonsai is placed on a stone (ishizuke) or simply stands as a solitaire in its bowl, the ensemble as a whole must still be a replication of nature, which is why upright trunks and the broom shape (kōkidachi) characteristic of German broad-leaved trees are also very popular.

**A companion for life**

At the same time, the potted miniature can grow as old as its model in the wild. Well-tended, a bonsai can be passed on to one’s children and from them to one’s grandchildren. However, it should be borne in mind that where nature is replicated on a small scale, the plants are easy prey for pests. In addition, fertiliser must be regularly applied – the frequency and type of fertiliser depending on the type of tree and choice of substrate. Mineral fertiliser is therefore advised for substrates with a large proportion of peat, whereas the fertiliser should be rich in organic matter for mineral plant substrates. Bonsai experts are therefore keen to stress that there is no universal guideline for plant care.

**Indoors or outdoors?**

The location, indoors or outdoors, has always been a matter of controversy. There is no doubt that conifer bonsais, for example, would feel at home outside exposed to the wind, rain and sun. Also, indoors, the bonsai pot needs sufficient light, although it should be remembered that tender leafy trees are inclined to shrivel quickly behind glass. Some argue of course that deadwood, which would have to be removed with the bonsai shears, also contributes to the detailed replication of natural features, since trees in the wild do not always grow straight.

**Bringing a bonsai home**

Bonsais, which are fairly fashionable these days, can also of course be found in supermarkets. Many experts advise against buying one, despite the attractive price. Because often the pots are the wrong size, wires have grown into the twigs, and the earth and roots have dried out because no one really takes the time to water them properly. In addition, these plants, even if they are healthy and thriving, can never keep pace with the meticulously designed arrangements of horticultural specialists. So a bonsai that we want to stay with us for many years should be worth its purchase price. But simply buying the plant in the pot is not the end of it. Because pruning and shaping of the miniature tree take time and involve effort and expense. A bonsai should be kept in shape exclusively with bonsai shears and other special tools. There are leaf cutters for removing shoots and branch saws when twigs have grown thicker and stronger. The accessory trade also sells knives for scoring and peeling off the bark, along with shovels and rakes so that the bowl and the tree’s surroundings are always neatly kept. If a bonsai is ever transplanted into a larger dish, there are also special root hooks and pliers.

**Oriental garden art in manifold manifestations**

While the Japanese style mainly seeks compliance with formal requirements, the European style aims to replicate near-natural shapes.
The cryogen-free measurement systems designed and manufactured by Cryogenic Ltd need to accurately assess and record temperatures as low as 1°K (-272°C), typically for the characterisation of new materials intended for use in extreme conditions. Cryogen-free is preferred because liquid helium is an expensive consumable which limits the application of low temperature technology, especially in countries that do not have indigenous sources of liquid helium.

“We were previously subcontracting our wire EDM requirements and realised how useful the process could be,” explains Dr Yury Bugoslavsky, Senior Project Engineer. “We tend to hold all of our key technologies in-house, so acquiring a wire EDM was deemed part of our general development as a sector leader.” The machine selection process commenced with inviting a small number of EDM sales representatives to the London headquarters of the 70-employee, £10 million turnover company.

“The presentation by HK Technologies was by far the best,” states Dr Bugoslavsky. “The Mitsubishi MV Series has certain key advantages that set it apart from competitor models, such as cylindrical drive technology, for example.”
Cryogenic Ltd opted to install a Mitsubishi MV1200R, a specially designated ‘high performance’ model in the MV Series. Installed in February 2013, the machine features four-axis (XYUV) linear shaft motors and one-piece, four-sided hardened tables. Both X and Y axes are mounted directly to a set of ways on the ‘T’ cast base. This style of direct axis mounting removes the squareness and repeatability issues associated with stack-table designs, providing higher rigidity and smoother movement. The MV1200R can accommodate workpieces measuring up to 810 x 700 x 215mm.

“During the commissioning period, initial cutting trials on a stainless steel cube measuring 10mm³ demonstrated accuracy of ±1µm,” says Dr Bugoslavsky. “We knew we had made the right choice.”

Today, Cryogenic Ltd uses the machine day-in, day-out to produce intricate, complex small parts with unusual forms from materials such as copper, brass, aluminium and stainless steel. For example, copper components might form part of measurement probes used to study the thermal conductivity of materials at extremely low temperatures. Similarly, brass gearbox parts might be used at very low temperature and strong magnetic fields to measure the electrical resistance of anisotropic materials.

“As well as eliminating outsourcing costs, the Mitsubishi MV1200R has also imparted greater levels of control in our manufacturing process,” concludes Dr Bugoslavsky. “We have some customers who demand very specific requirements and extremely short lead-times, particularly for prototypes.”

Cryogenic Ltd is a vertically integrated operation in that it designs and builds using in-house facilities, then tests and installs its equipment. The use of internal resources is preferred as it allows the company to control all the critical elements of the production process. The production facilities today include a substantial machine shop: aside from multi-axis Mitsubishi wire cutting, the company operates several milling and turning machines.
Environmental protection – a change of heart in metalworking

Environmental protection is now on the map in the metalworking sector. But what exactly does this mean? In metalworking particularly, such as with EDM systems, high power consumption and the cost of materials are a key factor. So what improvements are possible here and what steps have already been taken?

The onset of industrialisation brought with it ever-increasing in pollution. Today, each wave of modernisation and each new technological breakthrough is accompanied by increasingly strict environmental standards. A change of awareness has taken place not only in the minds of end-users but also among industrialists. The key concepts here are not only the consumption of power and materials, but also product and machine durability and the resources used. Mitsubishi Electric takes a clear stand on environmental protection with a commitment to the sparing use of resources and cutting energy costs. The EDM systems of the MV series conserve resources with their Long Life System (LLS). This is an overall strategy that facilitates, for example, new strategies for deactivating functions no longer required, intelligent “sleep mode” management and significant savings thanks to reduced quantities of circulating dielectric. These clearly testify to a change of heart in metalworking.

The facts leave no room for doubt: up to 69% less energy, up to 46% lower wire consumption, up to 45% lower filter costs and up to 25% less ion exchange resin. In addition, with its MV series, Mitsubishi Electric also scores with an innovative drive system. The Optical Drive System using Tubular Shaft motors makes wire-cutting much faster and also entirely wear-free. And this has been essential for achieving the marked drop in expenditure on energy, filters etc., in practice.

Ultimately, environmental protection means not only waste separation, renewable energy and durability, but also innovative, eco-friendly processes. And this is only possible with properly thought-out machines. And on this count, Mitsubishi Electric clearly heads the field.

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An exciting proposition for industrial companies

Energy-conserving air conditioning

So that Frankfurt Airport will stay competitive in the long term, the new Gate A-Plus for up to six million passengers per year has been built at Terminal 1. Conditioning the air of the interior retail areas posed a major challenge and created almost insoluble problems for designers and plant engineers.

The new terminal building with its floor space totalling 185,000 m² has been open to the public since October 2012. Up to seven wide-body aircraft like the Airbus A380 can dock at the gates here at the same time.

There are three levels, for arriving, departing and transit travellers respectively. So that passengers can make use of various services and spend their stay in comfort, an atrium is available as a marketplace comprising shops, restaurants and five business lounges.

Special requirements of the air conditioning

The very first drafts envisaged an innovative retailing and restaurant concept in the form of spacious marketplaces so as to offer passengers a quality ambience during their stay. A major problem was how to handle the high input of heat from the bright and welcoming lighting, high passenger throughput and aircraft traffic in the immediate vicinity that made continuous air-conditioning of the shopping areas necessary. “The task of air-conditioning mainly involves creating a pleasant climate for travellers while shopping before or after their flights,” explained Rolf Wiesinger and Klaus Westermayer, Managers of W+W Kälte- und Klimaanlagenbau GmbH, who were responsible for the concept, design and implementation of this project.

Because of the unique situation, an air-conditioning strategy “off the peg” was out of the question. “This is where more specialised solutions were called for,” Wiesinger continued, “in order to appropriately air-condition the floor space let by operating company Fraport AG to retail chains. The factors that have to be considered include the architecture and the needs of security and safety. In this part of the building, for instance, it’s not possible to discharge the heat loads outside via the roof.”

Comparison of different approaches

Air conditioning requires, first of all, a supply of cold water by the operating company that comes from a central cooling station via a pipeline system – with a feed temperature of 15 °C and a return temperature of 19 °C. In view of these high temperatures for a cold water system and the high density of installed lines above the suspended ceiling, it soon became obvious that, with a heat load of 60 W/m², cooling with conventional cold-water recirculation air coolers would not be the ideal solution, if only for installation reasons. As an alternative to cold water, a solution with a water-cooled VRF (Variable Refrigerant Flow) direct evaporation cooling station via a pipeline system – with comparable systems on the Frankfurt Airport site also prompted the client to approve this system. In the new A-Plus terminal, a total of 5,600 m² of retail space will be cooled and heated with the proposed solution in all-year operation. The first area in which this strategy came to fruition is the Heinemann Duty Free Shop on the second level of the new terminal building. This is where four water-cooled refrigeration units (type PQHY-P450) accommodated in a plant room adjoining the shop are in action, each with an output of 50 kW for refrigeration and 56 kW for heating. The air is conditioned by ceiling-concealed units with recirculated air, each with an output of 16/18 kW for cooling/heating. For the purposes of control, several units have been grouped together in a single climate zone. “In view of the size of the areas, it is by no means impossible for one climate zone to be cooled while another has to be heated,” Wiesinger explained.

As an alternative to cold water, a solution with a water-cooled VRF (Variable Refrigerant Flow) direct evaporation cooling strategy proved to be far less expensive. “This is mainly due to the very much lower air throughput and hence the lower power input of both the cooling plant and the ceiling-concealed units. Cooling performance is identical despite the superior air-conditioning comfort,” Wiesinger explained.

The client was impressed by the detailed list of costs and the comparison of all relevant parameters of the various air conditioning systems. Trusting relations with the client stretching back years and the specialist installer’s experience with comparable systems on the Frankfurt Airport site also prompted the client to approve this system. In the new A-Plus terminal, a total of 5,600 m² of retail space will be cooled and heated with the proposed solution in all-year operation. The first area in which this strategy came to fruition is the Heinemann Duty Free Shop on the second level of the new terminal building. This is where four water-cooled refrigeration units (type PQHY-P450) accommodated in a plant room adjoining the shop are in action, each with an output of 50 kW for refrigeration and 56 kW for heating. The air is conditioned by ceiling-concealed units with recirculated air, each with an output of 16/18 kW for cooling/heating. For the purposes of control, several units have been grouped together in a single climate zone. “In view of the size of the areas, it is by no means impossible for one climate zone to be cooled while another has to be heated,” Wiesinger explained.

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Japanese cocktails

A journey for the senses

After a busy day at work, our body often needs release from stress and from the mulling-over of problems. A good idea in this context could be to savour a delicious Japanese cocktail in a pleasant environment. Take yourself on a voyage of discovery and allow yourself to be surprised by the variety of cocktails available.

No two bars are the same, and bartenders differ equally in terms of quality and what they serve. Such factors as units of measurement, capacity and alcohol strength are just as important in the accurate mixing of a cocktail as the visual presentation of the finished result. Precise measurement in the centiliter range is all-important for a Japanese cocktail.

For this, the bartender uses his measuring cup as well as special scales. The bartender also needs experience and a keen palate for the tasting of newly created cocktails. Then there are the soft skills, such as empathy, humour and charm that all go to make a good barman or barmaid.

Sake – rice wine or rice liqueur?

The making of sake involves the generation of heat that inevitably arises during fermentation. The conversion of the rice-and-water mixture into sake by adding yeast is an art in its own right. How exactly it should be defined, however, is a matter of controversy. Some experts call sake “rice wine”, while others insist on “rice spirit”. Basically, there are several makers, and the alcohol content varies upwards from 15 per cent by volume. While wine is traditionally made from grapes and usually has an alcohol content of 9 to a maximum of 14 per cent by volume, spirits have higher contents. Interestingly, the alcohol content of Japanese sake at 15-20 per cent is much lower than that of its Chinese counterpart (at up to 40 per cent by volume). For the sake of compromise, one could agree to classify sake as potent rice wine or a thin-bodied spirit.

Since Japanese sake is not as alcoholic as the Chinese equivalent, it can be used entirely differently as a cocktail ingredient. To create a good Japanese cocktail, you can dispense almost entirely with a large repertoire of...
cocktails. In addition to the well-known “old-fashioned”, there are numerous other whisky cocktails that are worth trying.

Ginger Hibiki, Japanese coffee and mint julep

To make a ginger Hibiki, pour 4 cl Hibiki whisky with ice cubes into a tumbler and then top up with ginger ale. A very refreshing beverage and easy to mix as well. Japanese coffee, on the other hand, is the equivalent of Irish coffee but with Japanese rather than Irish whisky. Another variation on the whisky cocktail theme is the mint julep. For this you need about ten leaves of mint, a sugar cube, 6 cl Japanese whisky, 4 dessertspoons crushed ice and about 4 cl soda water. Using a muddler, first crush the mint leaves together with the sugar cube in a tumbler. Then add the Japanese whisky and stir the mixture with a bar spoon until the sugar has completely dissolved. Add the crushed ice and soda water and your refreshing whisky cocktail is ready to savour.

The world of the cocktail is not only colourful, but also incredibly multifaceted as well as varied. New compositions are created every day. What makes Japanese cocktails different is that they make use of Japanese alcoholic beverages. Very popular of course is sake, the national drink, although there is no end to the rise of Japanese whisky. MIZUBASHO PURE sparkling sake is also highly celebrated.

So it would seem that cocktails are subject to the same laws as fashion: tastes are constantly changing. Cheers!

Ingredients. It takes just a single additive, such as raspberry syrup or grenadine, to convert Japanese sake into a cocktail. Compositions of sake and gin are also very popular. In winter, hot sake cocktails have their seasonal appeal.

Much like rum in grog, sake can serve as the magic additive to hot water. Nagai Inc. in Kawaba in Japan has now introduced a new production process for its MIZUBASHO PURE sparkling sake. Premium Sake Junmai Ginjo serves as the basis. Sparkling sake can be drunk neat or in a cocktail.

How about MIZUBASHO PURE plus Aperol, for instance? If you prefer something a little sweeter, you can add a little crème de cassis or lychee liqueur to your sparkling sake.

Ayaka – cocktail of Japanese culture

Ayaka is the name not only of a well-known Japanese singer, but also of a cocktail. All it takes is 3 cl sake, 1 cl redcurrant liqueur, 1 cl vermouth (amber), 1 cl freshly squeezed lemon juice and, as a garnish, a slice of lemon and a cocktail cherry. Pour all the ingredients apart from the garnish into a shaker with ice and shake thoroughly. Then strain the mixture into a chilled Martini cocktail glass. Just add the lemon slice and cherry on a cocktail stick to the Japanese cocktail – and there you have it!

Sakerinha – a Japanese cocktail Brazilian-style

While the caipirinha is made with cachaça, its brother, the “sakerinha”, calls for good Japanese sake. The preparation of these two cocktails is basically identical apart from the main ingredient. You need 5 cl sake, an untreated and washed lime, two bar-spoonsful of cane sugar and crushed ice. First dice the lime and tip it into a tumbler together with the cane sugar. Then mix and crush everything well with a muddler. Finally, add the crushed ice and sake. The sakerinha is served with a straw and occasionally with mint leaves.

What many people don’t know is that the Japanese distil their own whisky. Well-known brands such as the Yamazaki 18 or the Hibiki 30 years prove that the Japanese are capable of producing good whiskies. The Japanese whisky from Hibiki has been marketed by Campari Germany since mid-2013. And the market is continuing to grow.

Anyone who prefers to sip older whisky neat can resort to 12-year-old Japanese whisky for his cocktails. In addition to the well-known “old-fashioned”, there are numerous other whisky cocktails that are worth trying.

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denied, and the gulf between you and your plans is constantly growing. Don’t even consider giving your partner eroded workpieces to make these plans come true.

You lack both the compassion and the time to maintain good relations.

Virgo (24.08.–23.09.)

Watch out, Jupiter is in square with Saturn. Everything’s got to go. Get rid of all the scrap that’s been accumulating. You don’t need the rejects either. After the turmoil in the recent past, the subject of romance has little interest for you at the moment.

But there are more important things: concentrate more on your career, for example.

Libra (24.09.–23.10.)

Saturn is in sextile with Neptune. You discover hidden talents. The clock generator helps you develop your musical abilities and, in coordination with pulse duration and interval, you’re soon launched on a musical career – in a duet with your beloved wire-cutting machine.

Scorpio (24.10.–22.11.)

Pluto is in a dynamic with the sun: Many a physical ailment vanishes as if by magic, and at work everything’s a breeze.

Between you and your EDM machine the atmosphere is electric. Your ideas yield improvements, and you earn praise from all sides. Lean back and savour this pleasant state of affairs.

Aries (21.03.–20.04.)

You and your EDM system understand each other blindly. Your career is going from strength to strength, but the moon and Pluto are now in disharmony. Your partner is displaying increasing surface roughness. So why not raise the pulse frequency with flowers and chocolates and spend more time with your family than on your unconventional ideas for workpieces.

Aquarius (21.01.–20.02.)

Jupiter is in conjunction with Saturn. In the first half of the month, you have a turbulent love life. In your choice of words and actions, beware of the effects around the edges, otherwise your relationships may suffer from unwanted embrittlement.

The second half of the month is then more peaceful and you’ve got more time for your hobby.

Pisces (21.02.–20.03.)

The gloomy sky is currently the only thing that bothers you. Your work and your love life are both coating along. The stars couldn’t be better for you, but don’t relax. Instead, erode everything you can. Your hard work will make your bank account swell and you will be richly rewarded at home as well.

Cancer (22.06.–22.07.)

Transiting Saturn is in square with the moon. The unpleasant experiences of your life are now trying to impose themselves on your thoughts again. Simply treat these thoughts to a skim cut and go away for a few days with your diesinking machine. At your holiday destination a little surprise awaits you that will give you the necessary energy for the coming weeks.

Leo (23.07.–23.08.)

You’re affected by a Mars-Pluto dynamic. You feel that your will is being
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