

new premises, strategically sited in Xinzhuang – Shanghai's geographical centre and near Asia's largest traffic intersection of 11 roads! This makes it easy for fast access to the nearby provinces of Zhejiang and Jiangsu, both of which are undergoing rapid industrial development.

Phenomenal growth & development

Jonathan Zhang talks about the rapid pace of development: "A lot has happened since we started here in Shanghai nearly ten years ago. Those days were dominated by labour-intensive manufacturing with relatively low quality output, alongside a certain amount of medium quality production. Today we find the entire quality spectrum, with high quality products accounting for an ever greater share. And the export share is increasing all the time."

Jonathan continues, "The figures speak for themselves. In 1995, 250 imported EDM machines were sold. In 2004, expected sales are 5,000 EDM machines and 10,000 CNC milling machines! The five

when price pressure is so severe. As a consequence, System 3R don't get any "free orders" when machines are sold. Instead we have to hunt down every order ourselves!

"If you then consider that the price of tools is still on the same level as ten years ago, meaning that it's become significantly more expensive to invest in tools than in machines, you realise that it's by no means easy to conclude deals. On the other hand, 90% of all EDM machines are still being operated without a reference system. So there are still plenty of opportunities for us.

"The size of the country dictates that we follow a defined strategy which focuses primarily on "system customers" - medium-sized and large mould tool makers producing at least 30 mould tools a month. Generally, the management of these companies are open to the positive effects of a reference system – increased accuracy, shorter lead times and fewer rejects, all of which ultimately lead to greater productivity."

Victor Yang of the Beijing office takes up the story: "This is, however, a long process, since our work isn't finished when the products have been delivered to the customer. Delivery is followed by the installation of spindle and table chucks, and then by the training of the machine operators. After all, there's no point investing in equipment to boost productivity without learning to take advantage of the opportunities available. During this period we spend a lot of time with the operators

major EDM machine manufacturers alone – Agie, Charmilles, Makino, Mitsubishi and Sodick - sold 250 machines in 1995, 1, 600 machines in 2003 and 2, 400 machines expected sales in 2004. Very substantial growth, but with one major reservation. Today, machine manufacturers can only charge half what they could charge ten years ago – with margins very different from what they once were."

A defined strategy pays dividends

"This means that, over time, manufacturers will be delivering their machines 'bare'," Jonathan continues. "There's simply no room for accessories

and what matters here is wu-wei – action without action – in other words, getting something done by intervening as little as possible!"

The fact that this strategy has proved to be so effective can be seen not least at System 3R's main factory at Vällingby, Sweden, where they have now invested in new machines to meet an ever-growing demand, not least from the burgeoning Chinese market.

Jonathan Zhang concludes: "I would sum up System 3R's operation in China like this: *Most people see the world as it is; we see the world as it could be.*

Major Japanese exhibition heralds region's recovery

The 22nd Japan International Machine Tool Fair – JIMTOF 2004 – opened on an optimistic note, in line with forecast economic recovery. Demand for the 'three sacred national treasures' – flat screen TVs, DVD equipment and digital cameras – are expected to continue to increase for at least the next 10 years; certainly for a longer period than the previous IT 'explosion'.



The busy System 3R stand at JIMTOF 2004

Over 1,000 visitors registered their interest at the stand of System 3R Japan and their prime motivator was 'reduced costs and faster delivery times'.

This theme was taken up by the major machine tool builders who are now focused on offering their customers a 'total solutions' approach – to reduce manufacturing costs by increasing speeds, accuracy and efficiency of their machines.

With this in mind, 22 machine builders incorporated System 3R products on a total of 48 machines at the show, to demonstrate how these goals could be easily achieved. The ability to integrate hardware and System 3R production planning software – WorkShopManager,

for example – was also shown. Most of the leading machine builders have chosen System 3R as their 'selected partner'.

Foremost among the products highlighted were WorkMaster and WorkPal robots, including fully-automated production cells on the Charmilles, Matsuura and Yasda stands. System 3R products facilitating 24/7 unmanned 'lights out' production was also the main feature of the Makino stand.

System 3R tooling systems dominated this sector of the market at the exhibition and new products such as VDP and Delphin created great interest. These new highly robust production aids are especially important for the growing precision production requirements of maintaining high accuracy and stability under extreme conditions of 5-axis and high speed machining

At the end of the exhibition, System 3R Japan were able to taste the success of JIMTOF 2004 at their '3R-Day' cocktail party, which saw the stand overflowing with machine tool builders, dealers and customers.



Koichi Ishikawa, Chairman of the Board, of System 3R Japan

World Round-up

France

We had a very successful attendance at Micronora, France's major exhibition for high precision tooling. Over 50% of our new project enquiries were for metalcutting applications with a high proportion of visitors being very interested in our new VDP chucks. Customers now realise that our exclusive VDP Technology opens up a new era in precision production. Improved quality and productivity not only in existing machine tools, but also for future investment in 5-axis machines and High-Speed machining.

Germany

Full economic recovery is still some way off, but we have been very encouraged by our sales growth and maintaining our market share. Our success in providing innovative and practical solutions, together with excellent customer relations and support will place us in pole position for 2005.

Italy

The BIMU 2004 exhibition in Milan gave a clear indication that the market situation in Italy is still stable. Some sectors such as aerospace, energy, medical and packaging are still investing in palletisation and automation, but other sectors are still suffering from

fierce competition from low-cost economies. Our innovative solutions for improved productivity are gaining more and more recognition by our efforts to improve the competitiveness of our customers and we expect a measurable growth in sales during 2005.

Japan

The last decade of the 20th century is known as 'The Lost Ten Years' in Japan and it still has a major effect on our economy and on neighbouring countries in S.E. Asia. The government's 'Quota' system to protect manufacturing industry has stimulated some resurgence in activity but there are continual pressures to become more competitive in the global economy, especially in relation to price and delivery. This is where our palletisation and automation systems have been able to help customers gain productivity benefits, not only in EDM but also in metalcutting applications.

Switzerland

A 30%-plus increase over last year in global orders for Swiss machine tools has had a very positive effect on our OEM business. However, tool and mouldmakers are still reluctant to initiate new investment plans. Overall, automation projects and our success in providing tooling solutions for precision engineering have shown significant growth.

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The Newsletter of System 3R Group

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WORLD ROUND-UP

There's no getting away from it – China is big! A population of 1.3 billion people in a country of 9.6 million square kilometres with a speed of economic growth that is breathtaking.

In China you will find the entire spectrum of production – from the lowest quality to the highest – all driven by a 'frightening' energy you can almost feel. From the industrialised regions on the east coast the pace of progress is moving inexorably westwards, where there is huge potential. The effect of this heated Chinese market on the prices of steel and other raw materials is plain to see.

Today, China is beyond doubt "the factory of the world" in electronics and white goods, with the next wave of new companies predicted to be in the automotive industry. Several major players are already in place, but many more are queuing up to join them. The main reason is the cost level, which is generally very low, but accessibility to the largest potential market in the world is what makes it so attractive.

It is in this hectic environment that System 3R Far East operates.

Shanghai and Beijing

The company started in 1996 in Shanghai, where Jonathan Zhang moved to from

Singapore to set up our first local office in China with Kitty Tang as admin support. The year after, a sales office was opened in Beijing.

Today, System 3R Far East's operation in mainland China involves a sales team of six, backed up by an administrator – all supporting some 30

distributors throughout this vast country. And they do it effectively – with System 3R Far East's operation on the Chinese mainland accounting for about 60% of its total sales, even after such a short time.

Although the average age of our team is below 30, all of them are well-trained system engineers with sound experience of the machine sector or of tool production. And they don't just sit at their desks. It takes each of them 200 days' travelling to back up the distributors in the field. David Zhang is well aware that, whilst one deal in five is made with a direct customer, the other four are made through their distributor network.

In 2001, the Shanghai operation moved to

CONTINUED ON BACK PAGE...

Our own automation investment adds more muscle to the Vällingby factory

Production capacity at Vällingby is being increased to meet the ever-growing demand for System 3R products worldwide. For a long time there has been a Blohm Profimat 307 surface grinder, which has been used to machine the "cross" in Macro reference elements. This machine grinder has now been

nine workpieces.

The new machine does not have a conventional work table. The customary magnetic table has been replaced by a 3Refix table with built-on dividing table and a Macro chuck.

Production Manager, Thomas Karlsson, explains: "We now have a highly efficient double-

cell in which both machines are served by the same WorkMaster robot. The older machine is totally dedicated to the unmanned production of the reference element 24-hours a day. We use the new machine for manned grinding of "single crosses" – for example masters and levelling adapters – and then switch this machine to the unmanned production of reference elements for the remaining hours of the day. And it's needed as orders are getting bigger than ever before!"

A new, efficient wire EDM machine has also been installed – a Charmilles Robofil 440cc – replacing two older wire EDM machines. Soon, this machine will also be served by a WorkMaster for unmanned round-the-clock production of holders and parts for vices in the System 3R product range.



Our new double-cell served by WorkMaster



Shanghai – in many ways the symbol of the new China.

North America's Machine Tool industry is ready to take off

IMTS has always been a barometer used to gauge the health and direction of North American manufacturing. After what has seemed like an eternity of bad news over the last four years, the doors opened at IMTS 2004, with a sense that the corner had been turned and that there was now hope for a return to positive growth in the machine tool industry.

If one were to go purely on the show statistics (overall attendance and number of leads generated) the outlook for the future would remain dim. However, the credo "Quality, not Quantity" was the underlying theme, confirmed by the type of interest and customers we welcomed to our booth.

No longer are companies sending representatives to Chicago for the nightlife. There was a 'business-only' attitude for those who attended. Their agenda was clear: To seek out solutions to the problems of maintaining quality while cutting costs. Here is where System 3R has and always will offer solid solutions.

Delphin and WorkMaster are the stars

To quote Anders Utterstrom, one of the Chicago-based salesmen, "Delphin was the star of the show!" – a sentiment enthusiastically endorsed by the rest of the System 3R team.

With a wide array of General Engineering products taking half of the 160 sq.m. space, all levels of System 3R's solutions were on display. At the forefront was the introduction of the first WorkMaster application supporting the Delphin platform. This exciting addition to our already diverse WorkMaster repertoire will most certainly become a large part of future applications in this growing field.

Not to be outdone, the Die/Mould side of the booth attracted visitors who were

interested in seeing "what's new" in both die-sink EDM and wire EDM. A second WorkMaster, supporting a three-machine simulation with WorkShopManager, allowed visitors to see that the capabilities and capacity of the WorkMaster product line continues to grow to support the increasing role that automation must play if a shop is to remain profitable.

A toast to the future

Converging in the center of the booth, where Die/Mold and General Engineering meet, customers and prospects alike enjoyed a quick drink and a snack in the "Combi Café". Here is where the benefits and advantages of System 3R's solutions were discussed at length.

As the show got ready to close, there was a definite sense that, finally, the machine tool industry was on solid ground and that it was time for our industry to, once again, take control of its destiny. We at System 3R are certainly prepared to contribute to this rebirth and are presently following up on the projects that resulted from our efforts at IMTS 2004.



System 3R USA's successful stand at IMTS 2004

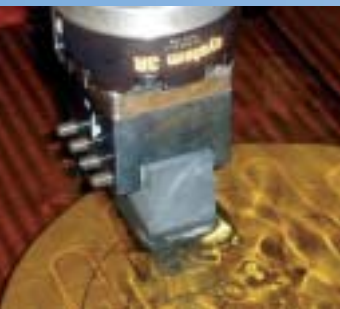
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SYSTEM 3R IN ACTION AROUND THE WORLD

Productivity lights the way

 Autopal s.r.o. of Nový Jičín, in eastern Czech Republic, established some 125 years ago and currently employing 4000 people, has been part of Visteon since April 2000. Their main products are headlight and rear light clusters for the international automotive industry, exporting over 95 per cent of production.



The Macro system at work in die-sink EDM operation

150 employees in the toolroom operate five Charmilles Roboform die-sink machines and two Robofil wire-EDM machines – all using reference systems from System 3R – producing mould tools up to 12 tonnes.

The Macro system was introduced in 1987 when a new die-sink machine was installed and in the last five years the MacroJunior system has come to be used for more than half of the graphite electrodes produced.

Pavel Chalupa, the engineer responsible for the toolroom, explains: "Autopal is focused on productivity. Standardising on one reference system and palletisation are our guiding principles. They not only allow us to make more complex mould, but also ensure that the user-friendliness of the Macro system makes life easier. Our customers demand ever shorter lead times and we can't afford expensive scrap, nor to lose time or money."

Because of this success, Autopal is now considering the next step to remaining efficient and even more competitive – full automation. Today some 40 per cent of their electrode manufacture is sub-contracted so

the need to become self-sufficient is an added incentive. They therefore plan to invest in a WorkMaster robot serving a machining center, producing an automatic production cell which can run around-the-clock!



Milling graphite electrodes in MacroJunior holders

A charged company

 In 1995 a young man with initiative left his government job and, in the true spirit of free enterprise, started a company to manufacture rechargeable batteries with basic premises and a handful of employees.

In 2003 this entrepreneur, Wang Chuan-fu, was rated one of China's top ten businessmen. In only 8 years, his company, BYD, had grown into the world's largest manufacturer of mobile phone rechargeable batteries with over 60% market share. It now employs around 30 000 people and has operations in several Chinese provinces, as well as Japan, Korea, Europe and the USA.

So it's quite likely that inside your mobile phone or your laptop you will find a BYD product - even if the brand name on the product is Nokia or Motorola, for example.



Wang Kai-feng the proud Moulding Department Supervisor

Row upon row upon row...

BYD's injection mould tool making and mass production division is based in Shenzhen, Guangdong province.

Wang Kai-feng, Moulding Department Supervisor at Shenzhen, is proud of the toolroom which has an enviable line-up of machines. 43 die-sinking EDM machines (Makino, Sodick, SKM), 8 wire EDM machines (Charmilles, Fanuc, Sodick), 19 CNC milling machines (DMG, Rüders, Mazak, Mori Seiki) - with the Rüders machines being used entirely for electrode manufacture. And they need to be, since each tool requires around 100 electrodes - half graphite; half copper.

Wang Kai-feng explains: "Here we



produce 120 mould tools a month with 80 more at our Shanghai factory. We have been in these premises for four years but in February 2005 we are moving to new premises, eight times the size. We need the space as we expect to be producing 500 tools a month in a few years' time.

At the same time as the move, we are installing 30 more die-sinking EDM machines and ten Rüders CNC milling machines."

The toolroom employs 500 people - 380 of these being operators or toolmakers - in three shifts and with a high proportion of women.

Productivity doubled!

Jin Xu-li, Assistant Manager of Tooling Department is highly enthusiastic about System 3R: "We introduced the Macro system in February 2004 and although not all our machines have been fully equipped, the results have been excellent. Accuracy is now twice as high. We can interrupt a machining operation to do an emergency job. Production costs have been reduced by one-third and productivity has doubled. We're counting on System 3R meeting our future needs."



At the beginning of 2004, Giampietro Monaco had the opportunity to acquire Costat, a plastics injection moulding company. It had been in business for 20 years and like many companies in the Turin region, was a supplier to the automotive industry and therefore an ideal fit with his own toolmaking business

But then he had to find someone capable to run the company and he actually approached one of his competitors, Salvatore Rizzo, whom he had admired for some time. Rizzo had 30 years' experience in the industry and had achieved much with limited means and great commitment. So, a deal was struck.



A dynamic duo – Salvatore Rizzo (Left) and Giampietro Monaco.

"I saw this opportunity as a real challenge," said Salvatore Rizzo. "I inherited 15 experienced employees and an ample range of machines, all of which needed to run as efficiently as possible. I was convinced that in order to succeed in this highly competitive sector you need to advance the operation from toolmaking to tool production. You need to minimise lead times, improve quality, minimise scrap and human errors. That's where automation is the answer!"

"But automation demands a uniform approach to working. What I found were competent employees but major shortcomings in systems thinking. The strategy was clear from the outset – step one was to change the culture in the workshop by introducing systems. Step two was to automate."

Lead times halved

Rizzo continues: "I have years of experience of System 3R products and their positive effects. Here, the



Car light cluster



The Delphin system offers fast and precise set-up of mould bases in the milling machines.

Innovative thinking gives company a new lease of life

Macro system had been used in the die-sinking EDM machines, but the inherent beneficial potential of integrating it as a system was not being exploited. Standardisation and systemisation are now keywords in the workshop and implementation has been relatively problem-free. Once people grasp the fundamental idea they accept it right away. Everything is so much simpler!"

Now Costat is using MacroJunior and Macro systems in the die-sinking EDM machines and in electrode manufacturing. The shape and position of the electrodes were determined when the tool was being designed using CAD/CAM. Two of the milling machines for machining the die sets have been fitted with the new Delphin zero-point system for fast, precise changes of the heavy workpieces.

The outcome of these investments, not so much in products as in employee training, has been good. "Since the beginning of the year, lead times for the mould tools have been broadly halved," explains Salvatore Rizzo with pride.

Committed to full automation

So the foundation had been laid for the next phase – full automation. A new high-speed milling machine was installed for electrode manufacture – a DMG 70 eVolution – in a production cell, served by a 32-position WorkPal robot.

"It's important to start at the right end when introducing automation," says Salvatore Rizzo. "There's no point investing in an automatic EDM cell if you can't feed it with enough electrodes."

Initially this production cell was expected to deliver about 100 effective hours per week. Further down the line, two new CNC milling machines are planned, as well as a further automatic EDM cell.

Rizzo concludes: "Today we have one person per machine, but in the near future I hope that one operator will be handling three fully-automated production cells. The

available machine capacity needs to be utilised efficiently round the clock, seven days a week.

Keep on running... and pedalling!



One of the world's leading mountain bike component manufacturers - Hope Technology of Barnoldswick, Yorkshire – has a constant need to gain productivity from their existing machines. And that is where System 3R stepped in by providing an easy and effective solution with the WorkPal Compact pallet changing robot.

Even though their Fanuc Robodrill 3-axis vertical machining centre came with a single pallet, the inefficiency of manual loading small bike components such as brake levers and brake cylinder caps was a problem.

"We were already using efficient pallet changing on our Matsuura MAM machining centre so automation was the obvious solution," explained Simon Sharp, Director of Hope Technology. "What we were concerned about was the retro-fit of a robot to an existing machine, but after looking at the major players we selected the WorkPal Compact and have been totally satisfied with its performance."

90% of components are aluminium and small so it was important that the maximum number of parts could be loaded at any one time. System 3R GPS 240 pallets (size 240 x 240 mm) therefore ensured that machine capacity was optimised with 6 pallets, which



Simon Sharp is impressed with the WorkPal's performance

are lightweight yet robust, further aiding the loading of the machine. The 0.002 mm accuracy of the system is also an added benefit which enhances the ISO9002 Quality Control Accreditation of which the company is proud.

The WorkPal Compact is what it says – with



its small footprint a boon in the converted cotton mill that is Hope Technology's busy plant. Installing the robot alongside the Robodrill was easily achieved. The rotary indexing magazine makes it easy for the robot arm to select a pallet and load it effortlessly through the automated sliding door onto the machine table.

Brake levers are machined 8 parts to a pallet and cylinder caps 20 parts per pallet, with different cycle times per part, so the WorkPal Compact allows for these variations and production is seamless. The clamping of parts to the pallets is also easy and robust.

"We have achieved what we set out to do with the WorkPal Compact. We have gained extra hours and extra production. It delivers unmanned running during shift breaks, after hours and, especially, while loading, without stopping the machine," continued Simon Sharp. "We are very pleased with its performance and the significant increased in machine utilisation and productivity!"

Established in 1987, Hope Technology is a leading name in the world of mountain biking, working at the cutting edge of engineering technology. The company currently employs over 60 people in manufacturing and design, exporting to over 30 countries. They are innovators in braking technology, including the introduction of disc brakes on bikes, as well as providing a wide range of other quality components - hubs, headsets, fork guides, seat clamps, skewers, stems and lights.

Landes have never looked back...



"Remaining a top sub-contractor was vital to our survival and future growth," explained John van der Laan, Managing Director of Landes Fijnmechanische Industrie BV, located in the north of Holland.



Managing Director, John van der Laan: "We've gained increased productivity and there is less scrap – both aspects lowering costs and hence improving our competitiveness."

"A significant dip in the market in 2002 immediately stimulated us into taking positive action so that we could remain strongly competitive and well-placed when the market took an up-turn. We weren't prepared to just wait and see, so we initiated a number of brain-storming sessions which led us to some fundamental conclusions about efficiency and productivity."

Up to that point in time Landes had worked a traditional shift system but this had in-built inefficiencies especially when the shifts changed. So a move towards automation seemed to provide the key to increasing machine output in a given period of time. Especially as their customers – including those in laboratory and medical equipment, aerospace, textile machinery and general engineering – increasingly demanded shorter lead times.

Because of the size of the products they were machining, often in small production quantities with varying cycle times, unmanned or low-manned production based upon a pallet system seemed the answer.

Confidence in System 3R

Research into the marketplace quickly established the way forward and Landes invested in their first automated production cell at the end of 2002. This comprised a DMU 50 eVolution machining centre plus a WorkMaster robot with a 41-position magazine.

"The preference for System 3R," says van der Laan, "was based on technical evaluation and on their valuable experience and support that they could offer all the way through the automation process. System 3R understood precisely what we wanted and gave us the confidence that it could be achieved technically and organizationally."



DMU 50 eVolution with WorkMaster and magazine on the right-hand side

This initial set-up for full automation turned out to be so positive that the first production cell was quickly followed by a second one, but with a DMU 70 eVolution machine.

"Both production cells are cutting for 18 - 20 out of 24 hours – in line with our most optimistic expectation. Compared to the old shift system, it is a great improvement," explains van der Laan. "The losses in machining time from lengthy set-up times every product change meant we were only previously getting about 40 per cent of the time in production, if we were lucky!"

Five-axis machining

Now, one operator controls both production cells during normal working hours. At the end of the day the cells are fully programmed for unmanned operation throughout the night by using WorkShopManager, System 3R's special production planning software.

Because of the type and size of products they machine, care is taken to ensure that the

pallet capacity is used to its optimum for continuous production which may result in the clamping of different parts to a single pallet. Even then, if an operator is required to reset or reload the cell, an SMS text is sent to notify him of its status.

5-axis machining for complex parts has also become an important reality with the efficient clamping and accuracy features of System 3R pallets. "Five-axis machining in one clamping is not only faster," explains van der Laan, "but it also prevents inaccuracies due to the inverting of the metal or plastic workpiece."

Benefits all round

"The arrival of the two production cells required some organisational changes. The introduction of new software always leads to adaptation. For many products new software had to be written and two milling machine operators have been retrained as programmers. The pressure on the work preparation department has grown, with customers taking advantage of our ability to meet even quicker deliveries. Tool supply must be 100 per cent," continued van der Laan.

"On the other hand, we have achieved important quality and productivity improvements, and there is less scrap – all helping improve our competitiveness. Last but by no means least, automation certainly did not lead to forced resignations or reductions in staffing levels. On the contrary, we have recently engaged some new employees!"



The 41-position magazine fully-loaded with palletised workpieces

NyproMold leads the way to the future of mouldmaking



In order to continue growing, NyproMold Inc. of Clinton, Massachusetts, required a new building and more capital investment in equipment.

However, they wanted to remain in the town of Clinton since the majority of their employees lived nearby. The problem was that the only suitable location for a factory was already occupied by the town's baseball field. After some discussion with the town's officials, a mutual agreement was reached whereby NyproMold would build, at no cost to the town, a new and modern recreational facility at a different location. In return, NyproMold would be able to build their factory on their selected location.

Ghassan Aswad, Sales and Marketing Coordinator, explained that they broke ground for the new building in 2002, and it took approximately one year to build. Moving in and setting up took six months, and they are now up and running. Visitors to the 104,000 square foot plant can get an overall view of the manufacturing area from above, through a "window wall" in the upper observation deck.



Bill Muldoon, President of NyproMold.

Built for maximum efficiency

The principals of NyproMold, Bill Muldoon and Brian Walker, understood several years ago that the future of mouldmaking was in automation. Early discussions with System 3R, paved the way to the automation principles applied by NyproMold today.

By walking the length of the observation deck, it is apparent that the different types of machine tools are strategically located in specific groups for maximum efficiency. It is obvious that a great



Two Yasda milling machines work in tandem with the aid of a WorkMaster. The mill is shown machining steel components of the injection moulds.

deal of planning have been done to create an efficient manufacturing flow.

Ghassan Aswad explains: "20 die-sink EDM machines are operated, half of which are controlled by WorkMaster robots and half operator-controlled. We also employ 10 wire EDMs, with two of them controlled by a WorkMaster, and the rest operator-controlled."

Producing and storing the electrodes

Keeping 20 die-sink EDMs supplied with electrodes for around-the-clock operation requires highly efficient machine tools and proper production planning. High-speed milling machines, such as the Makino SNC64 equipped with robotic loading and unloading, are used to manufacture the majority of the electrodes.

Cataloguing and storing the electrodes is accomplished using a "Hanel Lean-Lift",



A tray of electrodes at the access station of the Lean-Lift is ready for transport and loading into the storage rack of a die-sink EDM cell

that is centrally located on the shop floor, and is controlled from an inventory access panel. Any group of electrodes can quickly be delivered to the Lean-Lift's access door for immediate use. This tower-type unit stores and protects thousands of finished electrodes from damage, while taking up very little floor space.

A concept comes alive

The die-sink EDMs are used to produce virtually all the mould cavities required. Once the electrodes and workpieces have been loaded into the racks and the EDM machine is programmed, an operator is no longer needed. The WorkMaster

accomplishes the loading, unloading and replacing the finished parts in the rack. When the last part is completed, it signals that the batch is complete.

When you watch a number of different machine tools, all being tended to by System 3R WorkMasters, the reality of "around-the-clock-manufacturing" hits home. It is a look into the future of mouldmaking.



Dual "drop tank" Ingersoll die-sink EDM machines are working around-the-clock, while being loaded and unloaded by a WorkMaster

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