

Precisely!

MAKINO Europe's Customer Magazine

02|2011

EMO
Hannover
19-24.9.2011
Hall 12
Stand B36



Makino exhibits in Hannover

Welcome to EMO 2011

EMO 2011

Outstanding return on investment

GSA

High-tech forging



Dear Reader,

As I write these lines, Japan's football team has just won the final of the Women's World Cup. In many ways, the Japanese were the surprise of the tournament – the underdogs who beat the favourites Germany, Sweden and America through a combination of technically brilliant football and a never-say-die spirit. In a year where Japan has suffered so many blows of fate, this victory must come as balm to the country's wounded soul. We sincerely hope this win will prove a positive sign for the future – in every respect.

The news from Europe and indeed America is not so favourable. The debt crises affecting Greece, Portugal, Ireland and Italy are undermining confidence in the euro while the impasse over the US debt ceiling is a threat to the global economy. Despite these dark clouds on the horizon, the sun is still shining on the machine tools' market. Fuelled by fast-growing economies in Asia, Europe's goods are in great demand and EMO 2011 could not be coming at a better time!

We have reached the final stage of preparations for the industry's biggest event for at least four years. Two years ago, EMO was a comparatively small show, staged at the height of the global recession. This year, we are looking



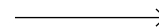
forward to a bumper event in Hannover and have devoted this issue to EMO 2011. Our keynote article (pp. 4-9) outlines the concept behind our exhibits and unveils one of the show's highlights – the world premiere of the D300 vertical machining centre. On pages 10-13 we take a closer look at a Makino customer in Germany, Gesenkschmiede Schneider (GSA). GSA is part of Mahindra Forgings Europe, which is one of the world's five leading forging corporations. That story shows why customers keep coming back to Makino: long-lasting precision and machining reliability.

Don't forget to schedule an appointment with us at EMO 2011. I look forward to meeting you in Hannover!

Yours sincerely, P. Anders Ingemarsson

A blue ink handwritten signature of P. Anders Ingemarsson, written in a cursive style.

President & CEO Makino Europe



Contents

- 4 **EMO 2011**
Outstanding return on investment

- 7 **EMO HIGHLIGHT**
D300: How flexibility boosts business

- 10 **GSA**
High-tech forging

- 14 **Makino Europe News**



We cordially invite you to join us at these events in 2011:

- Open House in Cavenago:** October 2011
- Open House in Kirchheim:** November 2011
- Open House in Bratislava:** November 2011



For detailed information and online registration, please go to www.makino.eu. We are looking forward to your visit!

Publisher: Makino Europe GmbH
Director of publication: P. Anders Ingemarsson

Makino Europe GmbH

Headquarters:

Essener Bogen 5
22419 Hamburg, Germany
Tel. +49 40 2980 9-0

Makino GmbH

Essener Bogen 5
22419 Hamburg, Germany
Tel. +49 40 2980 9-0

Kruichling 18
73230 Kirchheim unter Teck,
Germany
Tel. +49 7021 503-0

Makino France S.A.S.

ZA Les Bordes
21, rue Gustave Madiot
91923 Bondoufle, France
Tel. +33 169 1163-90

Makino Italia S.r.l.

Strada private delle Orobie 5
Località Santa Maria in Campo
20873 Cavenago Brianza (MB),
Italy
Tel. +39 02 9594 82-1

Makino s.r.o.

Tuhovská 31
83106 Bratislava, Slovakia
Tel. +421 4961 2-100

Ve Svahu 482/5
147 00 Praha 4, Czech Republic
Tel. +421 4961 2-100

Makino Europe GmbH

4th Dobrininsky Pereulok 8
Office C13-02, 119049 Moscow,
Russian Federation
Tel. +7 495 989 82-2

International Headquarters:

Makino Milling Machine Co., Ltd.
3-19 Nakane 2-chome
Meguro-ku Tokyo 152-8578, Japan
Tel. +81 337 1711 51
www.makino.co.jp

Europe-wide web address:
www.makino.eu

EMO 2011

Outstanding return on investment

Makino exhibits broad range of hardware and software solutions
to meet very different needs



The whole world of machining at a single stand: visitors to the 1,150 m² Makino Stand (Hall 12, B36) at EMO 2011 (Sept. 19-24) can see a dozen new machines on show. Thanks to this broad portfolio and the wide range of industries and applications it covers, Makino can not only provide all-in solutions to very different customer needs, but also help improve a customer's productivity and flexibility. What all these solutions have in common is their added value and ability to bring a sustainable boost to a customer's business.

Improving productivity

Productivity in machining is the product of efficiency and effectiveness. To improve productivity you need to be producing more in less time at lower cost and with less energy. The solution Makino offers to this challenging equation is based on three factors: first, machine stability, reliability and precision; second, sophisticated software to enhance those three parameters; and third, automatic functions with a built-in self-learning effect.

Sophisticated software

Makino machines are renowned for the world over for their stability, reliability and precision. But what about their sophisticated software? EMO 2011 will show that Makino has a lot to offer in this field, too. For example MPmax (Machining Productivity maximizer), a machine management software tool that enables a machine to sensibly plan jobs and optimise output. By constantly monitoring many machine parameters, MPmax helps to optimise machine utilisation by simplifying its operation and enabling the operator to take the right decisions. Incidentally, since most of the twelve machines at Makino's EMO stand will be managed by MPmax, visitors can see for themselves what advantages this software tool brings.

Makino's portfolio of sophisticated software tools also includes FFCAM and FF-Five, the 5-axis version of the same software. Suitable for any machines, this 3-D CAM software is extremely easy to use and generates programs of excellent quality. Since FFCAM allows any operator to create NC data easily and quickly, it boosts operation rates and helps significantly improve productivity by greatly reducing programming time. Operators of sinker EDM machines will find EDcam a great help. Taking as input the CAD model file, EDcam automatically generates the NC program, chooses the optimum machining parameters and can reduce set-up time by as much as 65% by eliminating the need for an on-machine dry run.

Error-avoiding automation

The third factor in Makino's equation for improved productivity is automation, as the story of the MAG1, the smallest member of Makino's successful MAG series of horizontal machining centres for aerospace applications, shows. Since 2000, Makino has doubled its spindle power and the material removal rate in aluminium applications. But how has the operator's ability to cope with a high-speed, high-power machine improved in the past decade? Since human beings unfortunately do make mistakes, Makino has focused on building machines that are easier than ever to operate and are more automated. Two examples will suffice. The Autonomic Spindle Technology in the MAG1, for example, enables the spindle

to automatically detect, think, decide what must be done and react to reduce the risk of damage to the tool or spindle, avoid chatter vibration and automatically find the optimal sweet spot. The MAG1's Collision Safe Guard Technology is a real-time, 3-D collision avoidance system that works hand in hand with MPmax to maximise productivity.



iQ300



a61nx



iGrinder G7

Reducing energy consumption

The new a61nx on show at EMO 2011 is an excellent example of how Makino has taken an existing horizontal machining centre and improved its performance by (among other things) reducing machining cycle times, expanding the working envelope, enhancing reliability and, most interestingly, reducing energy consumption. The three ECO mode options available for the a61nx – automatic power on/off control of the coolant temperature controller, an economy-type hydraulic device with automatic power off, and an inverter-driven TSC pump – make energy savings of up to 30% possible.

Flexibility to the fore

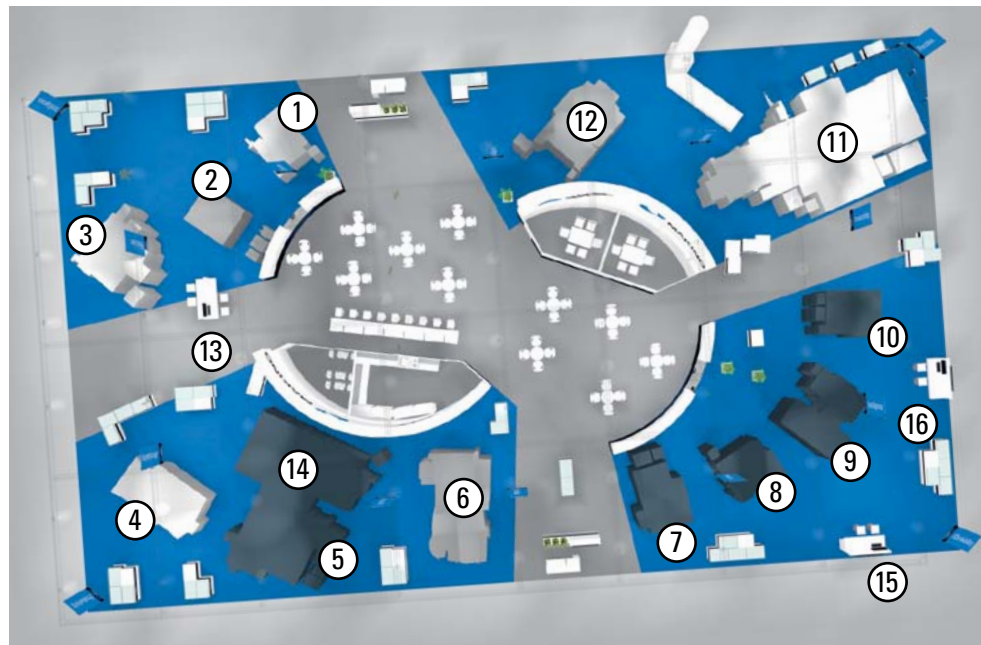
The economic crisis caused many firms – and particularly die- and mould-makers – to look around for new market segments where their precision expertise could be applied. But to successfully move into a new segment such as precision parts production, a mould-maker needs a machine that delivers not just accuracy, speed and long-term stability but also flexibility enhanced by automation. Makino has the machines that meet these demands, e.g. vertical machining centres such as the D500 and the D300, which has its world premiere at EMO 2011 (see article overleaf). Makino knows that automation only makes sense in combination with machine stability; otherwise, the quality of mass-produced items will vary to an unacceptable degree. At the EMO booth an automated production cell composed of the D500 and Makino's own Versatile Intelligent Production (VIP) system will show how high-volume parts can be produced with utmost precision.

Solutions for every need

The Makino portfolio enables customers to enter new segments through a wide range of hardware-cum-software solutions focusing on efficiency, premium and high-end applications: from the F5 to the iQ300 in vertical machining centres; from the a51nx to the A20 in horizontal machining centres; from the DU064 to the UPV-5 in wire-cut machines; and from the EDAF3 to the EDAC1 in sinker EDMs. The ultimate proof of Makino's ability to deliver so-

lutions for different needs from a single machine is the G7 iGRINDER. This EMO exhibit combines ultra-efficient grinding of hard metals for jet engine components with excellent 5-axis milling and drilling. That's the kind of multifunctionality that delivers added value through enhanced productivity and flexibility.

Further information:
precisely@makino.eu



- UPV-5 Oil Wire EDM ①
- iQ300 Vertical Micromachining Centre ②
- V33i-5XB ③
5AX Vertical Machining Centre
- D300 5AX Vertical Machining Centre ④
- D500 5AX Vertical Machining Centre ⑤
- a61nx Horizontal Machining Centre ⑥
- PS95 Vertical Machining Centre ⑦
- F5 Vertical Machining Centre ⑧
- ⑨ EDAF-3 Sinker EDM
- ⑩ DU064 Wire EDM
- ⑪ MAG1 5AX Horizontal Machining Centre
- ⑫ iGrinder G7 Horizontal Grinding Centre
- ⑬ FFcam-FF/Five CAM Software
- ⑭ VIP Automation System
- ⑮ MPmax Production Management System
- ⑯ EDcam SEDM CAM Software



EMO HIGHLIGHT

D300: How flexibility boosts business

**World premiere of the Makino
D300 vertical machining centre
at EMO 2011**

EMO 2011 sees the world premiere of the D300, the smaller sister of Makino's highly successful D500. Its outstanding features are indexing accuracies of less than 3 arc seconds and a surface quality of Ra 0.2 μm . What the D300 offers small to mid-sized firms looking to expand into new segments is a high degree of rigidity, utility and accuracy in a compact package. Not only are these the qualities aerospace suppliers want; they also give premium job shops and die- and mould-makers the flexibility to target new markets.



D300



Close proximity of the operator to the table and spindle

The D300 is flexible enough to serve a wide range of applications: production of impellers, blisks, blades and turbine parts for the aerospace industry; precision parts production for automobile, semiconductor, medical, optics and prototype applications at premium job shops; and plastic parts, die casting and forging at die- and mould-makers.

Rigidity, precision and speed

Though smaller than the D500, the D300 maintains the reputation for rigidity, precision and speed the bigger sister has built up. The highly rigid tilting table is supported on both sides and the A- and C-axes are driven by non-backlash direct-drive motors. Since the overall machining speed is dependent on both cutting and non-cutting time, the D300's 0.7 sec. tool-to-tool time and the 15 sec. pallet change for the 2-pallet APC are particularly significant.

Excellent operability

The biggest benefit the D300 has to offer in usability terms is easy access to the workpiece. The light and generously designed operator door operator ensures easy loading, the close proximity of the operator to the table and spindle ease of operation. Easy access to the workpiece is guaranteed by the compact design of the table and the spindle, which ensures they cannot collide. Here, the slim, cylindrical shape of the spindle nose plays a key role. Though the design of the spindle with its built-in coolant nozzle is new, the main parts are of proven reliability. The standard HSK-A63 spindle (15,000 rpm, 120 Nm, 11/22 kW) is based on the tried-and-tested Makino a51 model while the main parts of the optional high-accuracy spindle (20,000 rpm, 52 Nm, 11/15 kW) are taken from the Makino V33i.

Compact design

The D300's relatively small footprint (stand-alone: 2.8 x 2.5 x 2.5 m; 3.3 x 2.5 x 2.5 m with pallet changer) means it is significantly smaller than the D500 and most competing machines as well. What this means in practice is shown by the following key parameters:

| | | |
|--------------------|--------|--------------------|
| Stroke | XYZ | 300 x 750 x 300 mm |
| | A/C | ±120° x 360° |
| Table size | Table | ø 300 mm |
| | Pallet | ø 200 mm |
| Parts sizes | Table | 450 x 285 mm |
| | Pallet | 450 x 235 mm |
| Payload | Table | 120 kg |
| | Pallet | 100 kg |

The added value the D300 offers small and mid-sized firms is the flexibility to move into new segments – applications where traditional precision skills need to be paired with operational speed, machine rigidity and easy operability.

Further information: precisely@makino.eu



Easy access to the workpiece

High-tech forging

Keeping costs stable despite rising technological demands – with Makino's help

The heat is on at the die forge: massively powerful presses mould red-hot blocks of steel into shape; men perform physically demanding work under tough conditions; forging dies are subject to the stress of enormous pressures and extremely high temperatures. But here you also realise that die forging has turned into a high-tech process in recent years. And that places ever-greater demands on the tools used.

Mahindra Forging Europe

Gesenkschmiede Schneider (GSA) based in Aalen, Germany, is part of Mahindra Forgings Europe, one of the world's five biggest forging companies with a turnover of €250 million (2010) and over 1,500 employees at nine production sites in Germany and England. Mahindra Forgings Europe itself belongs to the Mahindra Group, one of the world's biggest multinationals with a turnover of US\$ 12.5 billion and a global workforce of around 120,000 in over 100 countries.

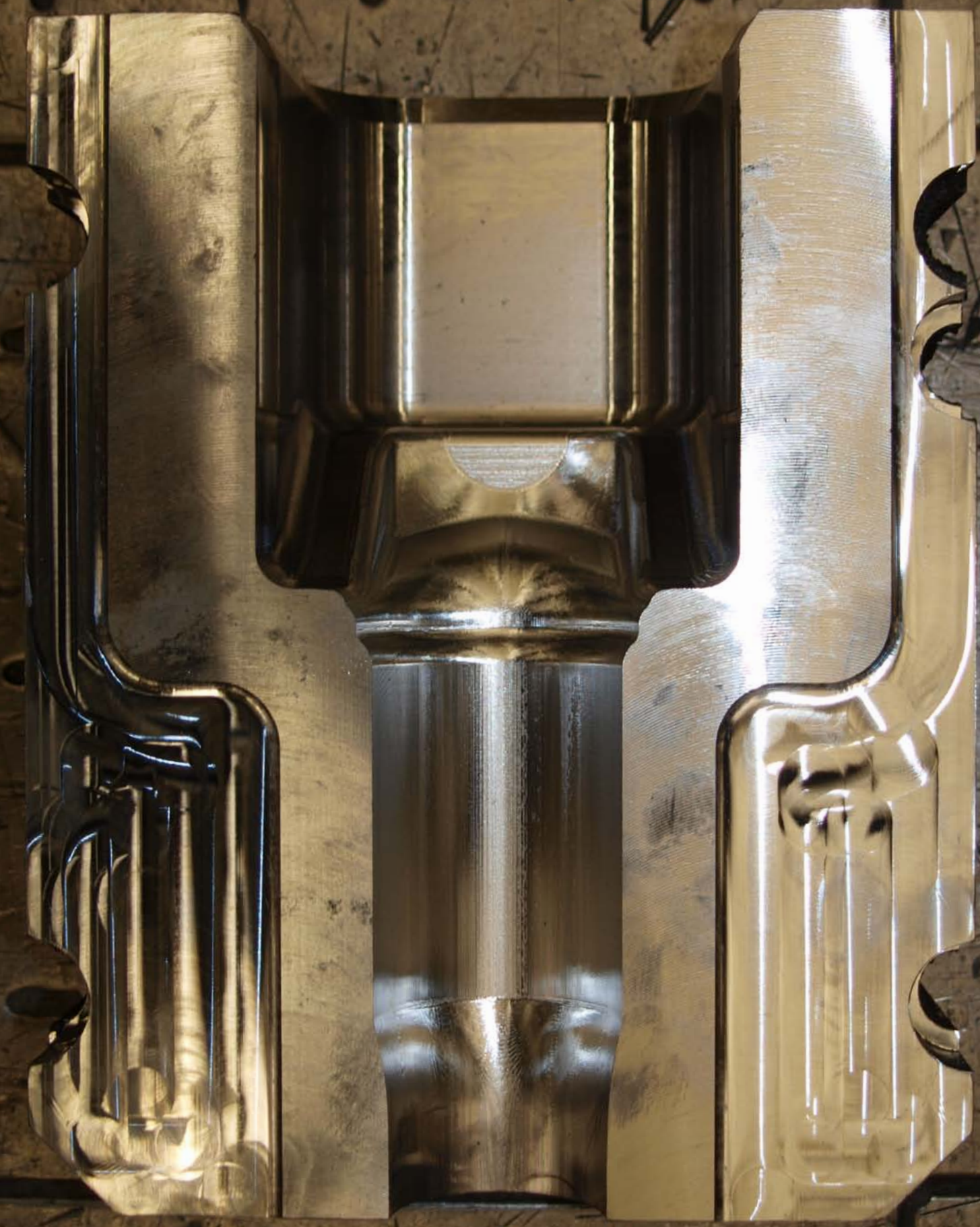
Fourfold competence

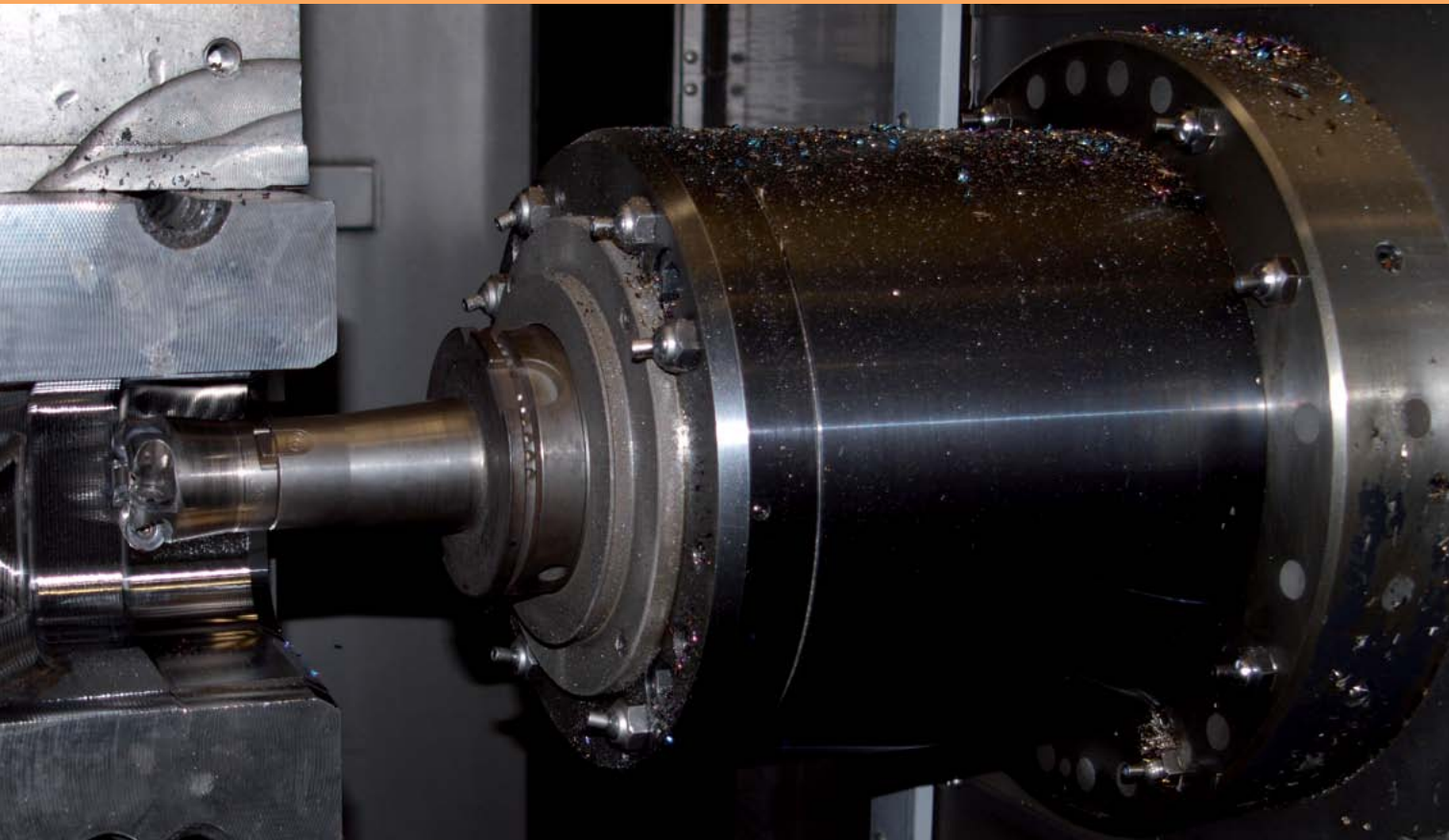
GSA specialises in the production of pistons, steering knuckles, shafts, valves, steering components and gear parts for lorries – manufactured by hammer, press, horizontal upset and precision forging, hot extrusion or friction welding and ranging from 120 g to 125 kg in weight. But what makes GSA truly special is its competence in four areas: forging know-how, strict quality standards, highly skilled

personnel and cutting-edge technology. Synergy effects within Mahindra Forgings Europe help GSA to stay at the forefront of forging technology. A strict quality-management system ensures that all GSA parts meet the uncompromising demands of renowned customers such as Daimler, MAN, Volvo, Scania, Fendt, John Deere and Linde. The GSA workforce is not only loyal and very motivated but also highly skilled. Further-training measures play a key role and with apprentices accounting for over 5% of the workforce, GSA makes sure it has enough well trained recruits in future, too. Since all apprentices are taken on after they have completed their training, no know-how is lost to the company. Moreover, GSA's commitment to extensive research has led to 18 patents or patent registrations in the past three years alone. This fourfold competence allows GSA customers to benefit from forged parts that are now more finely shaped, lighter and better-priced than ever before.



Gerhard Bayer, Head of the Tool Shop and Hammer Forging at GSA :
“For high-tech forging you need the best machining partner – and that’s Makino!”





Stable die costs

Forging dies come in for harsh punishment under the thunderous blows of a 20,000 t hammer press. Yet the forged parts GSA series-produces have to fulfil strict quality requirements and millimetre-precise specifications. A recipe for exorbitant die costs? Not at GSA. Theirs have been stable for years –

a key competitive factor in Germany where labour costs are high. The Mahindra Group knows how much GSA's technical leadership in high-tech forging is worth and provided financial backing during the recent recession. Although GSA suffered a 65-70% fall in orders in that period, no core personnel had to be laid off.

Reliable spindles

How has GSA managed to keep its forging die costs stable? Around twelve years ago, GSA responded to the rising cost of forging dies and filler material by switching to a flow welding process to produce the dies. However, the use of different-strength and increasingly wear-resistant welding fillers (36-58 HRC) in a single die places great demands on the milling process. Gerhard Bayer, Head of the Tool Shop and Hammer Forging at GSA, knew what to do: "For high-tech forging you need the best machining partner – and that's Makino!" Over a decade ago, GSA invested in two Makino horizontal machining centres – an A77 and an A99e – and although they have worked a 3- or 5-shift system ever since, the two machines are still operating with the original 18,000 rpm, HSK100 spindles. The reliability of the Makino spindles and the rigidity of the Makino machines have resulted in almost 100% uptime during the past decade.



Gerhard Bayer, GSA (r.) and Frank Burr, Makino, talking about the Makino F5

Even after a decade, the A99e is still operating with the original 18,000 rpm, HSK 100 spindle – as is the A77.



Fully welded die before machining



Fully welded die after machining

Capacity extended

Earlier this year, GSA was looking to extend its machining capacity for normal steel dies of up to 500 mm in diameter. The outstanding performance of the A77 and A99e over the past decade convinced GSA to go for another Makino machine. Yet before purchasing a Makino F5 vertical machining centre with a 12,000-rpm, 117 Nm, SK 40 spindle, GSA asked Makino to test the machine's precision and finishing qualities on a forging die made of 1.2344 steel. The F5 not only performed to perfection but was also 22.7% faster than the machines of alternative suppliers.

Makino recommended

GSA is utterly satisfied with the performance of its Makino machines – so much so that Managing Director Ernst-Peter Schmitz convinced his Indian colleagues to purchase two Makino V77 vertical machining centres for a Mahindra Forgings plant in India. Though initially sceptical about this investment, the Indians are now enthusing about Ernst-Peter Schmitz's high-tech recommendation. Numerous Makino machines are also operating in the die shops and mechanical metalworking facilities at other Mahindra Forgings Europe sites, e.g. Jeco in Gevelsberg, Germany. At Schöne Weiss in Hagen, Germany, they are currently installing new production facilities – and here, too, the machining line will be based on Makino machines.



F5

Further information:
precisely@makino.eu

News

Makino Europe

Zelnar Rzeszów, Poland

Situated at the heart of Poland's "Aviation Valley", Zelnar produces machining and bending tools, jigs and workshop fixtures, dies for pressure-casting of metals, press-forming and stamping, special fixtures and prototypes for new design solutions as well as offering processing services such as heat treatment, thermo-chemical treatment and length and angle measurements. At the end of 2010, Zelnar put out a tender for new machines and accessories and Makino joined the bidding process. After careful consideration of the various offers, the company chose to invest in two Makino D500s (with FF Cam) because they offered the best return on investment. The President, Andrzej Siwek, was convinced by "the world's best 5-axis vertical machining centre" (D500) and the full technological support, training and excellent automation solution Makino provides for the D500. Zelnar plans to invest in more Makino machines in the near future.
www.zelnar.com.pl



IGS GeboJagama Tilburg & Valkenwaard, Netherlands

IGS GeboJagama manufactures multi-cavity injection moulds, moulding tools and components to the highest material specifications, quality standards and validated levels of precision. The company delivers to customers all over the world from a wide range of industries, including healthcare, medical technology, aerospace, elec-

tronics, automotive and office equipment. To maintain its reputation for high precision in moulds, parts and components, IGS GeboJagama chose to invest in a Makino D500 vertical machining centre as part of a Makino Versatile Intelligent Production (VIP) System. This automation solution offers the flexibility and versatility required for high-mix, low-volume parts' production.
www.igsgebojagama.nl

Stromag France

Roissy, France

Founded in 1927, Stromag France (formerly Sime Stromag) is the world leader in industrial disk brake production, having installed the first industrial brakes in steel mills as early as 1966. For more than 50 years, Stromag France has developed, installed and maintained tens of thousands of industrial disk brakes all over the world – for demanding applications such as steel works' cranes, port cranes, wind turbines, belt conveyors, pedestrian transport systems and equipment at coal and nuclear power plants. Stromag France first invested in a Makino a81 in 2006 and has been highly satisfied with the design: torque of up to 488 Nm, high rigidity and a tool diameter of up to 300 mm in HSK100. When a new investment was decided on at the end of 2010, the company felt the choice was obvious: the new Makino a71 with its 242 tools and high lubrication pressure fitted the bill. According to Stromag, this latest investment "is certainly the best machining centre in the company".

www.stromagfrance.com



Aquametro

Therwil, Switzerland

Since 1928, Aquametro has been synonymous with high-quality metering technology. From its home market and headquarters in Switzerland, the Aquametro Group has expanded to serve markets in Belgium, China, Germany, Japan, South Korea, Singapore and the United Arab Emirates with quality products and system solutions. Aquametro recently purchased a Makino a71 horizontal machining centre, a decision based on the sound advice Makino was able to provide and the trusting relationship between the two companies.

www.aquametro.com

The new Makino D300:
More precise. More flexible. Stronger. Faster.
Just like your company will be.



Finishing completely cubic parts in only one or two setups?
 $\pm 5 \mu\text{m}$ volumetric accuracy in a five axis machine?

Join us in welcoming the new Makino D300. Five axes, so precise, yet so fast, so strong, yet so flexible that it will push your limits. Which means new business opportunities, new branches to serve, new qualities to offer. Elevate your company to a new level with the new D300.

When precision becomes passion.
Feel the difference at EMO 2011 and learn what your company could be.

