

BLUM
NOVOTEST

NEWS





Alexander Blum, President

Dear Readers,

Exciting times have arrived. It is not just world political events, but also the digitisation of our daily lives, environmental/resource protection and societal challenges that are currently electrifying the world. All signs are pointing to progress and accelerated transition in manufacturing and production environments. Good things like the growing number of jobs which require increasingly higher qualifications are however accompanied by greater requirements for training and open-mindedness. When jobs that demand less skills and qualifications fall away, they must be replaced by developing affordable service sector jobs. This is one of the great political/societal challenges of our age.

The interview with Dr Yoshiharu Inaba, Chairman of FANUC, published in this edition clearly demonstrates the trend in key industry sectors.

Just as the said societal challenges need to be addressed and tackled worldwide, manufacturing companies also have to deal with new and different situations on a daily basis. We thus secure our own existence and help to develop the future successfully.

Speaking as a technician, I am very excited by current developments and look forward with optimism to the changes.

While speaking as a businessman, it fills me with pride that we are able to successfully accompany you, as our customer, along these new paths thanks to our many proven and new technologies, such as roughness measurement in the working area, or the many new opportunities provided by scanning solutions in machine tools.

At Blum-Novotest we are gearing up for our 50th anniversary celebrations in 2018. And talking of round numbers, we are pleased to announce that the number of Blum-Novotest employees worldwide has passed the 500 mark due to successful cooperation with our customers. We have prepared well for future growth through key investment decisions to enhance capacities. And all this without reducing our extensive development effort so that we can continue to supply you with innovative, attractive products for increasing your profitability.

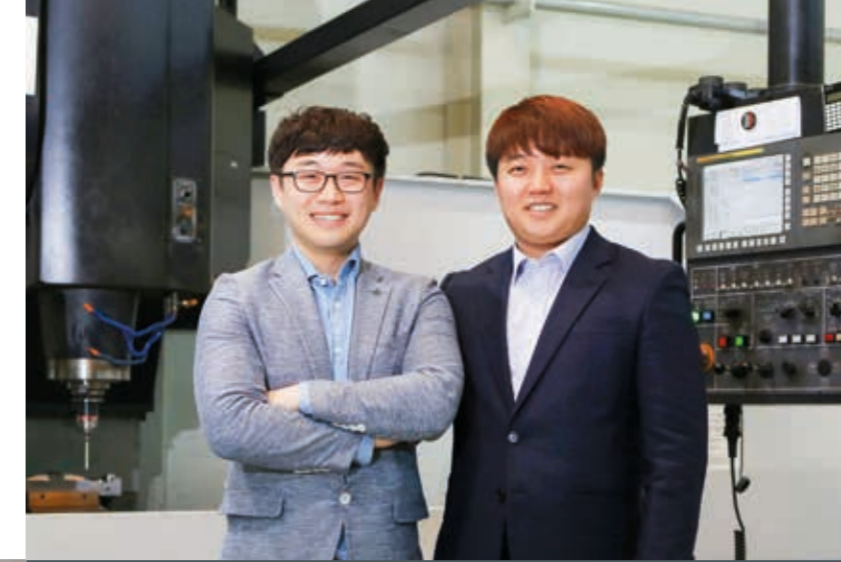
Our brand-new website, successful BLUM workshop concepts and in-house BLUM Tech-Talks, along with our activity on various "social media" platforms, help to consolidate the indispensable elements of trade fair conversations and face-to-face meetings for exchanging ideas with you, our customers.

I hope you enjoy reading our insightful articles.

Alexander Blum
President



Efficient processes for high-quality components



Left, Yong-won Lee and right, Jung-kyo Seo from G.O.M

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Among other things, G.O.M. also develops and produces components for the South Korean Space Programme, specifically for the Naro carrier rockets.

Successful partnership with BLUM

To satisfy the quality standards of its customers, innovative production resources, such as 5-axis machining centres equipped with precision production metrology, are absolutely essential. BLUM has been a production metrology partner of the Korean company for many years and plays an important role in the products produced by G.O.M. with its high-tech measuring systems and first-class application support.

Since 2000, BLUM's measuring systems have been operating absolutely reliably in the company's machining centres. Thanks to the use of BLUM products, G.O.M.'s workforce understands its cutting processes much better. They are easy to use and perfect for large-scale production. The high-speed workpiece probes, in particular, provide many benefits for production.

"The use of the TC50 touch probe in our machining centres, for instance, has enabled us to automate many work processes," adds Director Seo. "The workpiece position is automatically detected and processed after clamping. We can also use the machine's integrated and high-speed measurement functions to perform on-the-spot checks of critical workpiece characteristics and take any corrective measures early on. Thanks to the TC50, we have been able to increase our precision and reduce our machining times, which has made a decisive contribution to the competitiveness of our products."

After machining, the components are usually transported to a coordinate measuring machine for measurement – a long, costly and complicated process. Also, once removed, further work can only be performed on the workpieces on the machining centre with considerable effort. This is why G.O.M. uses BLUM's FormControl measuring software.

FormControl prevents errors in production that, for instance, may be caused by imprecision in machining parameters, tool wear or thermal effects. Deviations are detected early, as the software enables additional measurements to be performed during and after machining. Furthermore, since the measurement is performed in the original clamping, rework can be performed immediately. The duration and cost of the work are reduced significantly and the reliability of the work process is improved.

The user starts the actual measurement process at the click of a mouse. The software then automatically creates the NC program and transfers it to the machine control. In the next step, the probe is mounted in the spindle and the individual measuring points are probed in sequence. Data is transferred between the PC and the control via ADIF – BLUM's automatic data interface – which eliminates the risk of any errors caused by manual data transmission. ADIF manages complete data transfer between the NC and the PC. The measurements can then be output as a measuring report or visually, e.g. by means of coloured error needles on the monitor.

The company is very satisfied with the software – as materials in aeronautics, in particular, are after all expensive and tolerances very low. There is also often pressure to further reduce delivery times. "This is why FormControl is ideal and the benefits are much greater than we had expected. I think that it is also a useful alternative to external measuring machines for the machining of large parts, because the software helps to save time and improve precision. Procuring appropriate 3D measuring machines for such large components is costly and difficult," explains Director Seo.

Since the company was founded, BLUM's products have been a permanent part of G.O.M.'s manufacturing processes. "They represent top-class quality, precision and high in-process reliability and help to secure the competitiveness of our production and strengthen our image as a leading technology company," concludes Lee.

G.O.M. is a manufacturer of precision injection moulds and moulded parts for the automotive, aeronautics, medical and defence industries. Using BLUM production metrology, this Korean enterprise has ensured that high-quality products are produced at effective prices for more than 16 years.

The company, headquartered in Gumi, is well known in the respective industry for its enormous innovative capacity. G.O.M. continuously expands its range of products, constantly offering new precision components such as injection moulded parts and moulds for automotive headlights, dashboards and trims. The company also supplies components produced using multi-component injection moulding methods for many industries. Product development, product design, manufacture and shipping are all handled under one roof.

"Normally, it would be unusual for a company to produce both the moulds and the actual injection moulded parts," says Yong-Won Lee, Deputy Director. "When we began producing moulds in 1998, our intention was always to expand our expertise. In 2003, we began producing injection moulded parts, and in doing so, laid the foundations for continuous growth." The acquisition of many innovative machines, including 5-axis machining centres, hybrid and multi-component injection moulding machines

and 3D printers, is another clear indication of how focused and forward-looking the company is operating.

"For the production of multi-component parts, a technology that was specially developed by us is used, and this development required substantial investments," explains General Director Jeong-Kyo Seo. Unlike other small or medium-sized enterprises, G.O.M. has always invested large amounts in R&D. "We invest more than 20 % of our revenue in this area," says Seo. The company is growing quickly and is also expanding in the machining of components and special-purpose materials, a field in which G.O.M. also intends to expand along new paths.

"We aim to continuously evolve our technologies and further expand our leading role," explains Director Lee. The company therefore concentrates its efforts on future technologies such as the machining of components made of carbon and other hard-to-machine materials that are used, for instance, in aeronautics.



KOREA



Focusing on quality

Trust in cutting-edge production measurement technology has led to a successful German-Brazilian partnership – between Blum-Novotest and Tintomatic.



Lilian Barraud, Head of the Blum-Novotest Sistemas de Medição Ltda in Brazil and Claudio Berger by Tintomatic

The development of Tintomatic, the leading Brazilian manufacturer of paint mixers for paint manufacturers and stores, is a real success story. Founded in 1997, the company is now more successful than ever thanks to many correct decisions, tenacity and a never-ending quest for perfection.

Tintomatic has continued to grow since it was first started. "After manufacturing machines specifically for the production lines of large paint manufacturers for many years, we were asked by a European paint manufacturer – a market leader in Brazil – to develop a small paint mixer for the domestic market, as only imported machines were available in Brazil at that time. Just over a year later, we unveiled a mixer that is 100 % Brazilian and tailored to the specific demands of paint businesses," explains Alessandra Sales, Business Manager at Tintomatic.

These excellent customer relations are the basis for success at Tintomatic. The Brazilian company's list of customers includes almost every national and international paint manufacturer. The mixers are used by the majority of paint retailers in Brazil. Furthermore, the company supplies mixers to businesses in other sectors and sets itself the highest standards to ensure customers can expect the same high-quality, over and over again. "Our mixers are currently being certified by the European Community, as, besides Latin American countries, they are soon to be exported and sold in Europe and the United States," says the Tintomatic Business Manager with pride. "The fall of the Brazilian Real

against a strong Dollar has helped to make our product more competitive in the export markets. And we have to make the most of this opportunity," she claims.

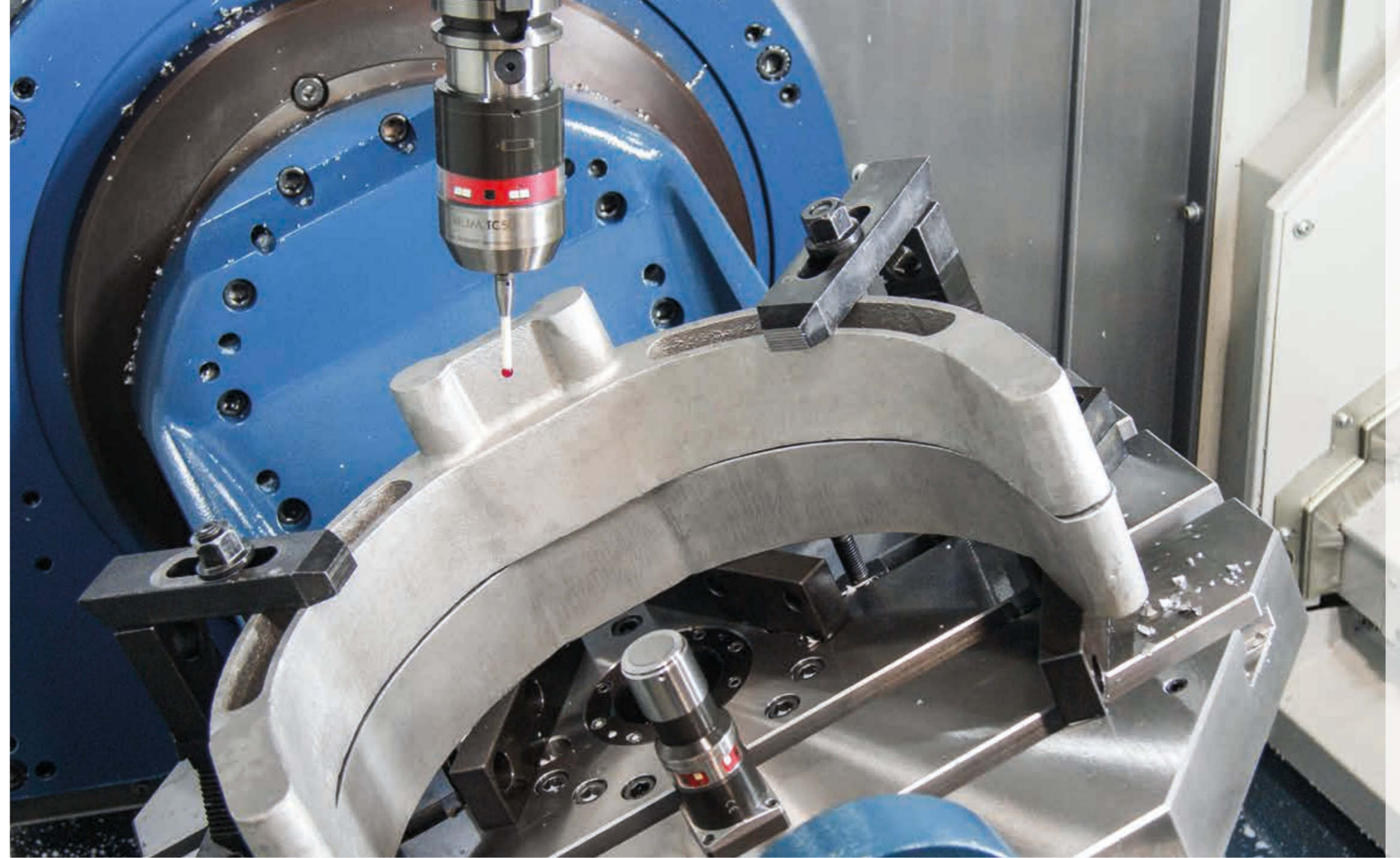
The company based in Indaiatuba, a city located about 100 km north east of the state capital São Paulo, used components from subcontractors in its products up until 2014. But the engineers at Tintomatic were often unsatisfied with the quality of these components, as dimensions were incorrect and the finish did not meet expectations. To solve this problem, a decision was taken to manufacture everything in-house in the future. "We then purchased the machinery required for production. Since the start of 2015, we have been manufacturing all the components for our machines, without any exceptions whatsoever. Our goal was to manufacture components of the highest quality. We have additionally developed methods, tools and procedures to enhance production capacities and increase quality and efficiency," Alessandra Sales explains.

When it was decided to purchase one of the first machining centres at the end of 2013, the technicians realised that the machine can be equipped with a touch probe. From the outset it was very apparent that this type of measuring instrument would improve process efficiency. When visiting various suppliers, the engineers then realised that many manufacturers use BLUM touch probes. This was reason enough to develop a partnership that pays off every day.

Increasing productivity by 60 %

This all led to Tintomatic purchasing the TC50 touch probe from BLUM. To test the performance, a speed test was initially carried out in the 3-axis Romi D800 machining centre while machining a cast aluminium gyroscopic arm used in mixers. The test result was quite surprising: "We were able to reduce the machining time from 25 to 6 minutes," Alessandra Sales explains. "Seeing as we were more than happy with the level of performance, we have had two further TC50 touch probes installed and are currently negotiating about a fourth touch probe for a 5-axis Mazak multi-functional machine tool." The robust BLUM measuring systems are simply ideal for use in the harsh environment of a machine tool. They guarantee precise machining and the best possible quality for all the manufactured components. "That is exactly what we want," declares the Tintomatic business manager.

Besides the touch probe, the company also employs the tool measuring system ZX-Speed from BLUM, which enables automatic tool setting in length and radius and tool breakage monitoring. An additional decision was taken to equip the new 5-axis Romi



machining centre with a wireless Z-Nano IR tool setting probe. Since a cable connection is not required, the operator can simply position the probe on the machine table for measuring and then remove it again. This is possible as the wireless Z-Nano IR system features a magnetic base for fast and secure fitting and removal.

Investment in the systems and accessories from BLUM "quickly pay off" according to Alessandra Sales. The parts being machined are after all made of cast aluminium and are subject to production-related deviations which make setup difficult. "The BLUM touch probe has simplified this process significantly. The operator clamps the cast part in the machining centre and the touch probe is then responsible for workpiece zero-point measurement. This process not only captures the reference points but also compensates any inexact workpiece alignment. It all goes very fast and is very precise."

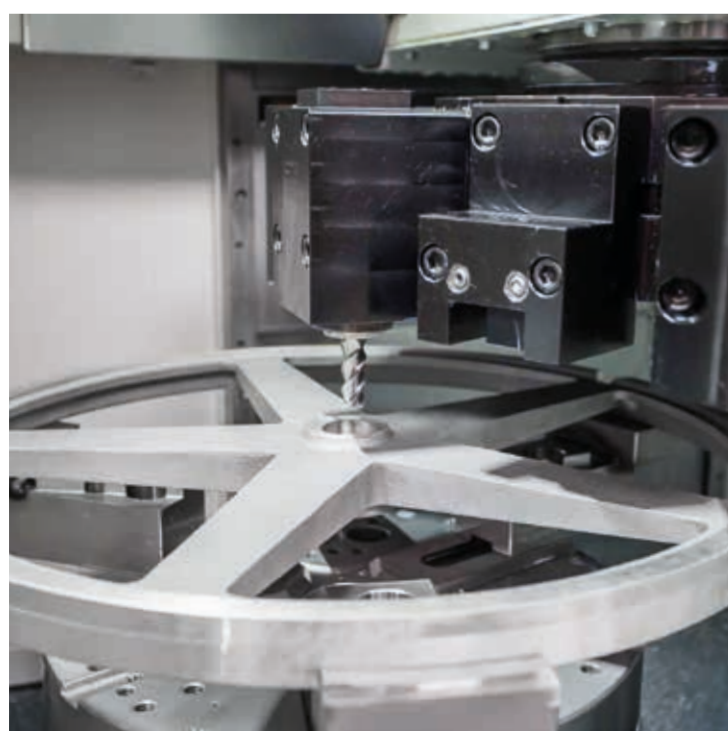
A very high measuring speed and the enormous increase in productivity, precision and quality of workpieces – these reasons are more than enough for Alessandra Sales to continue the partnership with BLUM. However, the appreciation expressed by Tintomatic for the German manufacturer is not just limited to production results. The know-how, diligence and flexibility shown by BLUM as part of its customer service offerings are second to none. "We have never had any problems with BLUM and they have always responded flexibly and professionally whenever we needed their help."

The Brazilian manufacturer strives to provide its customers with the same level of diligence and quality through its own customer service. These corporate values have helped Tintomatic gyroscopic mixers gain an 80 % share in the Brazilian market.

Tintomatic is currently investing in new machine tools and further accessories that reflect the latest technology standards in order to increase its international competitiveness. In addition to the recently purchased 5-axis machining centre, the Brazilian company is already planning to automate its production line. It is planned for robots to insert turned parts and thus enhance productivity even further.

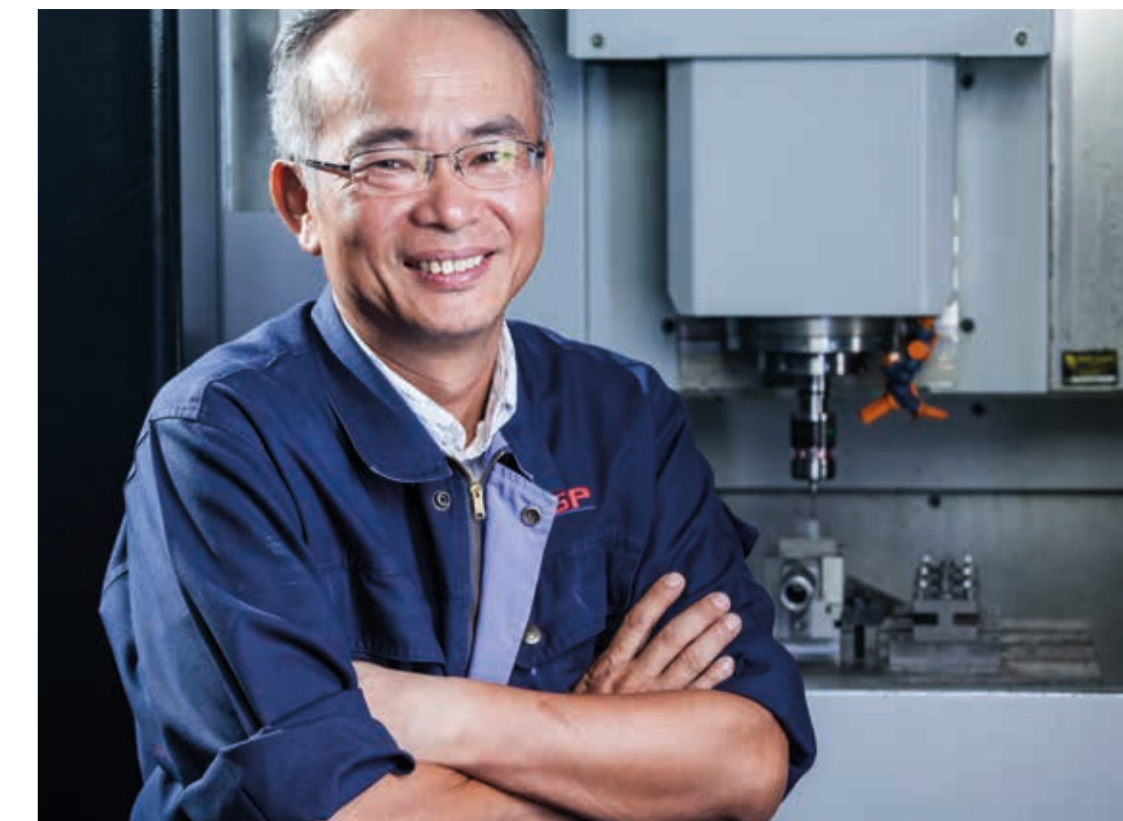
This new level of automation includes accessories for the machine tools. Products supplied by BLUM are ideal for this undertaking. Additionally, by integrating BLUM products in the production chain, the company's workforce should have direct access to the most effective and efficient tools to manufacture products that stand out from the crowd due to their exceptional quality. And this degree of commitment is really worth it, as it also allows access to new markets. "The level of competitive pressure in the international market is high, and only those who meet deadlines and deliver the highest levels of quality consistently will be successful," Alessandra Sales explains.

"When presenting a product that is of higher quality than a competitor's product, we demonstrate to the customer that we also have a responsibility towards their business, as our product offers a better end result and that is what counts. The goal for 2017 is to reduce human errors to a minimum and thus guarantee the highest level of quality for Tintomatic products. And in contrast to many other companies that believe quality can be 'controlled' we would rather invest in systems that enable us to achieve our quality objectives. Quality is not something you can control but something you produce," Alessandra Sales declares.



Innovative technologies to reduce costs and increase productivity

Production Manager at Meisou SNC Precision Co., Ltd. (MSP) in Thailand



Meisou Inc., the parent company of Meisou SNC Precision Co., Ltd. (MSP) in Thailand, was established in 1993 with the mission of precision manufacturing of injection moulds for semiconductors. Right from the start, the company has been committed to the development of trailblazing technologies in the area of injection moulding tools. In order to manufacture even more productively and efficiently, the company has relied for several years now on Blum-Novotest measuring technology.

In November 2014, MSP was established in Thailand as a foreign partner company jointly managed by the SNC Group. With its high precision processing technologies, Meisou SNC Precision Co., Ltd. (MSP) is now able to manufacture various components for precision devices such as injection moulds for relay components or moulds for vehicle electronics components. For a company managing fundamental changes in manufacturing processes, innovative technologies are a decisive factor in its continued success as a supplier of high-end products such as smartphones and tablets as well as of environment-friendly electrical devices. Accordingly, MSP is constantly searching for new technologies. This also includes the development of training programmes to keep its employees in the picture about innovations. The aim is to increase competitiveness in order to keep pace with a growing demand for precision injection moulded parts. For the company it is not just a question of competitive pricing, it is above all a question of quality, which must be nothing less than excellent.

The manufacture of injection moulds demands high levels of precision, especially in the processing of surfaces. These must be extremely smooth and completely comply with customer specifications. Accordingly, MSP attaches particular importance to the measurement of workpieces. Formerly, workpieces were always measured outside the machining centres meaning that machining errors were only identified at a late stage. Tool set-up on the CNC machines was also very labour

intensive and time consuming, reducing productivity. The production manager explains: "The manual input of the workpiece position and the checking of the finished workpieces took an unnecessary amount of time. This reduced our production throughput and profitability. We therefore needed a solution that cut downtimes and reject rates. Our objective was to simultaneously increase efficiency and product quality."

The best way to solve this problem was to reduce the number of work steps in production by using efficient tools. This approach harmonises perfectly with "focus on productivity", the motto of Blum-Novotest. With BLUM measurement technology, the production process was made more efficient and the number of work steps significantly reduced. A TC52 measuring probe was therefore installed on the 5-axis Mitsubishi "µV1 Precision" machining centre.

With this measuring system, Meisou was now able to perform workpiece measurements and set-ups at rates of 2000 mm/min. Unlike many other measuring sensor systems that employ the Tripod principle or use highly sensitive switch components, the TC52 operates with a high precision, multidirectional measuring unit.

The BLUM TC52 measuring probe enormously reduces the number of manual work steps that are otherwise required to set up workpieces on machines, resulting in a massive reduction in setup time. It enables a reduction of costs and hence has very positive impacts on production efficiency and profitability. As the production manager puts it: "In this way, we have not only increased our efficiency, but have also increased the quality of our products. We have determined that with the use of TC52, it has been possible to reduce time expenditure for the measurement of workpieces by 30 to 50 %." The BLUM TC52 is located in the tool magazine during machining and is automatically swapped-in only for the required measurements. Even the extreme acceleration forces do not in any way impair its performance.

Since MSP was established, the market in Thailand has moved heavily in the direction of precision products. The MSP management therefore made the decision to manufacture its products in future according to the Japanese industry standard. BLUM measurement technology was perfect to help reach these objectives; after all it is synonymous with a high level of technical competence and outstanding service quality. After initial experience with BLUM products, the company quickly recognised their high performance and informed the parent company about the acquisition. The result was an increase in productivity of between 30 and 50 %.

There was a small learning curve when the system was first introduced to the MSP production line, due to the lack of experience of the local workforce in Thailand. For example, a stylus was damaged during operations. "BLUM reacted immediately to our enquiry, even though it was the weekend and sent the required spare part by courier the same day. Thanks to BLUM's excellent customer service, our production downtime was kept to a minimum. This incident reinforced our confidence in BLUM and served as an example for our own customer service," comments the production manager.



With TMAC, Cauquil is taking another step towards the industry of the future

Cauquil is committed to using new technology that will improve their manufacturing process. A specialist in machining hard metals for the aeronautics sector, this French company has just rolled out BLUM's TMAC system across their machine park. This solution adapts the feed rate in real time and alerts the operator to any probable wear on a tool. It is a new step forward for Cauquil on their way to the industry of the future.

The world is changing and French industry must change, too. It must adapt to the ever-changing demands of the market and look firmly to the future. A French industry of the future will not be a revolution or a rejection of what we already have. It will be quite the opposite: every company, according to its size, its resources and its objectives, will integrate the solutions, tools and technologies that will allow it to face these new challenges head-on. Its production processes will become better and faster, allowing it to leap-frog the competition while enhancing and simplifying the work of its employees.

Cauquil is the perfect example of a French company which, since 2010, has turned resolutely towards the industry of the future. It specialises in hard metal machining and boast 23 machining centres featuring 3 and 5-axis units for both small and large-capacity production runs. The company has been consistently focusing on new technology, developing its manufacturing process to meet the heightened expectations of the industrial aeronautics sector. Since it was founded in 1947, it has been regarded as an expert in prototype and small-series component manufacture (up to 200 units per month).

Aircraft door-stops, Airbus A380 engine mounting shackles, hydraulic blocks, chute clamps and more. "Every component, from the simplest to the most complex, is within our grasp," says Didier Cauquil, CEO of the eponymous company. It is allied with the Simair Aeronautics Group, forming a medium-sized company and ensuring that it has all the skills to keep Airbus, Safran and its other full sub-assembly manufacturing clients happy.

The company is driven by reactivity and quality. "Every single one of our components is delivered on time, with zero defects. We can manufacture and deliver urgently-needed components within hours." Didier Cauquil's expertise enables him to immediately identify any design error in a plan that would hamper or slow manufacture. He is a man with experience in the field, mastering the operating systems in his machining plants and is able to launch a production run in just a few clicks. This is one of his company's strengths and a real source of pride: automation and optimisation of the tool management, scheduling and production systems using custom-made software designed to his exacting standards.

It was in this vein that Cauquil rolled out an ERP-based IT system run through each workshop supervision programme. The ERP collects the names and ranges of the items machined, enabling it to control costs, deadlines and traceability for the entire process. The supervision software used to manage and control the JFMX production systems was developed by MCM, a machine tool manufacturer, and can interface with the entire machine park – even with machines made by different manufacturers. It also handles productivity management and has an integrated maintenance plan. As a result of these investments in digital technology dating back to 2010, the production side of the company is more flexible and responsive than ever while guaranteeing greater production quality. "These machines run in 3x8 shifts, but only need a single day-shift team. We can insert a single, urgently-needed component into the production flow for a whole series of other components without disrupting the process. What is more, the software was designed and configured to be usable by an operator with no specific machining expertise. The HMI guides them through the operations and alerts them to any maintenance tasks that need doing," explains Didier Cauquil. Every machining plant is run using the same application. Additionally, there are three 3D measuring machines in the workshop used to automatically check the finished products. These machines determine any corrections that need to be made and send this information to the workshop supervisor. The measurements are recorded and then incorporated into statistical methods in order to optimise the product control strategy.

Measurements are a vital part of Cauquil's quest for impeccable quality. Each machining plant is fitted with a BLUM Mini, Micro Single or Micro Compact laser system which uses a contactless measuring process to check product compliance against the specified tolerances. Run directly from the workshop supervision software, these systems check the condition of the tools and detect any breakage. This is valuable information, but how can tool wear be detected between two checks? And what if the tool breaks during the machining process? In the best case scenario, the tool breakage detection system will halt the machine. "When this sort of incident happens during the night, the machine can only be reset the following morning when the operators are back on site," says Didier Cauquil. It was with these problems in mind that he turned to the TMAC system from BLUM.

Technically speaking, this is not a measuring system. TMAC uses real-time power consumption data for the spindle and/or axis motors in a machining centre to deduce the probable wear on the tool. It is a system that works: the more a tool is worn, the more the spindle is forced forward and the more power it consumes. However, you do need to configure TMAC for each tool so it can determine the reference power thresholds. But the TMAC is not just used to sound the alert when a tool is getting worn. Thanks to its real-time awareness of each tool's power consumption, it can continuously adapt the feed rate and authorise accelerations of up to 200 % when the spindle is travelling through empty space.

The TMAC system was installed in 2014 on a 5-axis machine so that it could be operated by Cauquil under real production conditions. "We wanted to take the time to properly evaluate this solution, to think about how we could make the most of it and explore all of its possibilities. We also wanted to integrate it into our workshop supervision software so that it would offer a greater deal of transparency to the operators, and so we would not have to modify our production programmes," explains Didier Cauquil.

After two years of use, TMAC has proven its worth and has been gradually rolled out across all of the machines. By monitoring the power consumed, it can identify probable tool wear and also problems relating to tightening, lubrication, machine adjustment, sharpening and even material consistency. "If a tool wears out quickly, questions are raised about the quality of the material we are using," says Didier Cauquil. Additionally, by adjusting the progress speed according to the power consumed, and especially by accelerating when the tool is in empty space, the system has provided significant gains in productivity for certain production runs. Finally, TMAC avoids the needless disposal of tools. They are no longer changed as a precaution; rather, they are changed when it is proven that they are worn out.

The system has been generically configured for every type of machine, but in the future it could be adapted to the tool, the assembly, the material used and many other factors. "By analysing the power curves, we can also identify any problematic machining operations and improve the manufacturing process," confides Didier Cauquil. With TMAC by Blum-Novotest, the company is taking another step towards the industry of the future.

FRANCE



Game-changing measuring systems for Industry 4.0

Reliable sensors are essential for safe, unmanned processes with a reduced number of staff. The motto of Blum-Novotest GmbH's current trade fair programme is therefore: "Reliable sensor technology for Industry 4.0". The company will, in particular, be showcasing solutions for "analogue contour scanning of workpieces in machining centres", "reliable measurements with coolants" and "greater productivity through efficient process-integrated roughness measurements".

"The digitisation of production has been on everyone's minds for quite some time now and is more relevant than ever after the term Industry 4.0 was coined. A cornerstone of this process is the creation of fully networked and end-to-end process chains. In machine tools, this demands the application of production metrology, as failures or unreliable measurement results contribute to a much greater loss in productivity than would be the case with conventional production processes," explains Heribert Bucher, manager of the division Measuring Components at Blum-Novotest. "Numerous application examples show why BLUM touch probes, lasers, DIGILOG and roughness measurement systems are an essential part of the fourth industrial revolution."

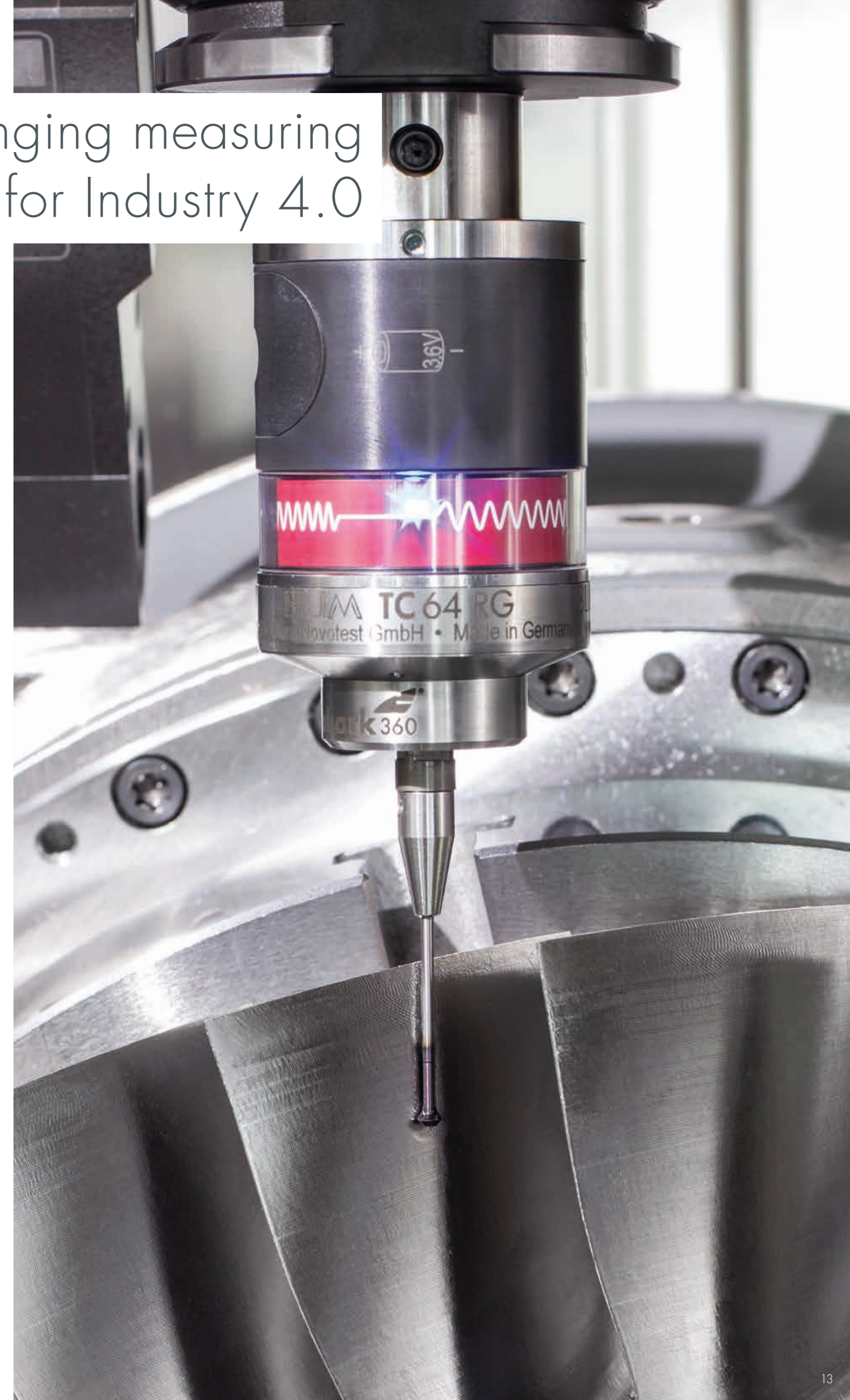
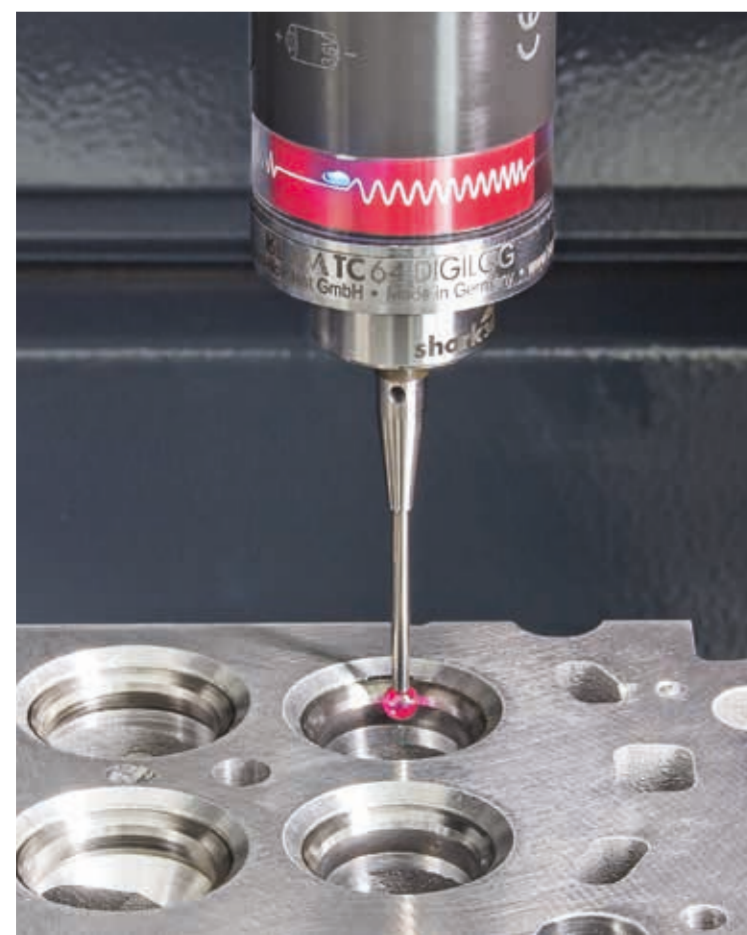
The challenges faced by measurement technology inside machine tools are very different to those encountered when carrying out measurements outside the machine. Cooling lubricant and oil frequently become an underestimated source of incorrect measurements when using standard touch probes. This is the reason why many users have, until now, been of the opinion that precise measurements in a machining centre can only be carried out on workpieces which are dry and free from oil and grease. Blum-Novotest is currently producing proof of the contrary at numerous trade fairs worldwide. Using impressive live demonstrations, the company proves that current BLUM touch probes deliver reliable, efficient and ultra-precise measurements even when using coolants. The reason for this is the unique measuring mechanism technology: pre-deflection and an increased measuring force ensure that coolant has no impact on the actual measurement even at a measuring speed of 5 m/min. The bidirectional measuring mechanism of the TC61 touch probe even enables pulling measurements of grooves and bars.

A further highlight of the BLUM show is the display of the current capabilities of DIGILOG technology. To achieve high compression

ratios in combustion engines, the contours of the sealing chamfer at the valve seat ring must meet strict tolerance requirements. The concentricity of the valve guide and the valve seat is also of major importance within this context. Until now, these features have been measured much later and outside the machine; a process that resulted in high scrap rates of expensive cylinder heads. On the one hand, BLUM's TC64 DIGILOG touch probe measures the concentricity digitally; on the other hand, the system enables analogue scanning and thus monitoring of the sealing chamfer while the workpiece is still clamped in the machine.

BLUM also presents its latest solutions that focus on the hot topic of 'machine-integrated roughness measurement': When machining blisks for aircraft engine turbines, there is a need not only for dimensional accuracy but also for a defined surface roughness. In this case, surface roughness gauges such as the new TC64-RG are used to ensure machining faults and poor surface qualities are detected during the process. If ultra-precise, basically DIN-compliant measurements as small as one tenth of a micron are required, the roughness gauge is guided across the workpiece surface at a comparatively slow measuring speed. When it comes to detecting machining errors in the micron range – a role for which the BLUM roughness measurement systems have been specially developed – measurements can be carried out up to 20 times faster. Even coolant or grease on the surface only affect the result slightly.

"Industry 4.0 has been an established practice at Blum-Novotest for many years, in fact we were actually implementing these processes before the concept even had a name," Heribert Bucher claims. "Ultimate reliability in the harshest environments is a matter of course for BLUM products. We can therefore offer a process-integrated, Industry 4.0 suitable solution for numerous measurement activities."



Perfect processes

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Alteams Group is one of the largest light metal foundries in Europe focussing on communication networks equipment, power electronics and other advanced industrial applications. Since 2015 the Group has been cooperating with Blum-Novotest. Equipping the Alteams facility at Lebork with BLUM measuring technology shortened production time and ensured high-end standards and quality control.

Alteams is a company with over sixty years of experience in the production of cast light metal components. It operates in two fields – communication networks (NET) and mechatronics (MET). With six aluminium casting factories around the world and two logistic centres in Europe, it is the biggest supplier of cast light metal components for the telecom sector.

In 2013, Alteams Poland Sp. was founded and only one year after that the factory in Lebork started production. Now, with almost 9000 square metres of working space, it is one of the most innovative, state-of-the-art foundries in Europe. This factory uses high-pressure die casting methods and specialises in machining, assembly, surface treatment and supply chain management (SCM) to deliver ready-made components directly to customers' assembly lines.

Time is of the essence.

Very high standards and market demands entail short production times, sophisticated measurements and quality control. Alicja Kobiela from the Development Department says: "The main problem in our company was the waiting time for the measurement results, both in mass production and in the implementation of new products. Our products are quite complicated with regard to dimensions and precision is essential; hence, the quality control process is one of the most important elements of the manufacturing process. Currently, we have only two CMM measuring machines, therefore, the devices are quite overloaded. This in turn increases

the waiting time for the result. The priority is always mass production because here we have to minimise the risk of errors; the measurements of new products were thus often queued. Therefore, we wanted to transfer measurements directly to the manufacturing process." That is where BLUM touch probes came in.

BLUM comes into play.

Cooperation between BLUM and Alteams started in 2015. The first step was moving the measurements from CMM to the CNC machines in order to reduce measuring and control process times. Installation of a TC52 touch probe with special measuring stylus and a ruby ball diameter of 1mm at a length of 50mm on the Brother TC32B QT CNC machine equipped with a Brother B00 control allowed us to verify the same characteristics as with a CMM machine. After two weeks of taking measurements from both machines, the comparison showed great results. With a total deviation of just a few percent, it was time for the second stage. This part of the project involved implementing the TC52 probes on ten machines and moving the control process from the CMM department to the production process. It slightly prolonged the cutting time of each component, but the main result was an increase in total quality control and mitigation of the overload of the CMM measurement. The outcome was a reduced waiting time for the control results from 24h to 2-3h and, consequently, a significant increase in the overall production flow.



Saving and storing huge amounts of data, where the characteristics of all the parts were measured, proved to be one of the biggest challenges. An innovative solution was used and each CNC machine was connected to the server via a LAN port where Blum-Novotest's Quickstart software was able to send the measuring results directly to the server. Using special calculating software, the evaluation of the results and monitoring of the problems can be done online in real-time. This means that the quality control department has access to the characteristics of the part as soon as the machine stops cutting it. This provides completely new possibilities for the control, analysis and quality assurance of the production.

The final stage of the process was to use BLUM TC52 touch probes on the machines to set up the production before quality issues and errors even occurred. With the complete analysis of the production problems, most common errors could be identified and overcome. Introduced improvements included automated setup of the workpiece zero offset according to each part deviation and additional rotation of the element to eliminate clamping issues.

Thanks to this, entire batches of rejects could be reworked with the right adjustments, which helped to considerably limit scrap during production. "Today, a significant part of the measurement is carried out during production. This way, we have greatly reduced our costs while maintaining high quality," concludes Alicja Kobiela.

The main advantage of this project is capability for fast adaptation of the control process from monitoring oriented to 100 % measured parts. The flexibility of the system opens up a wide field of possibilities, making the production process faster and more material-efficient.

Looking to the future

"We are planning further expansion of the system, including connecting all BLUM devices to the SPC (Statistical Process Control) system which will allow for even greater use of their potential," adds Alicja Kobiela. Furthermore, a special tool provided by Blum-Novotest called FormControl, that is used like CAM software for creating fast measurements, was successfully introduced in single production.



BLUM measuring components prove to be game-changer for job shop

For a lot of job shop owners, large capital equipment purchases can be intimidating undertakings. Here is how one small shop owner upgraded his facility and equipment with state-of-the-art machinery and precise production metrology, resulting in a clear return on investment. As a result, the company is now a lean machine shop, benefiting from quick setups and high-precision output.

Based in Batesville, Miss., Magnolia Tooling is a privately held shop. Owner Jonathan Johns heads the seven-man team. His latest hire joined the company five years ago, but otherwise, Jonathan's employees are the same as when Magnolia opened its doors for business in 1998.

Jonathan started his business with a manual mill, a grinder, a surface grinder and a manual lathe. Steadily, Magnolia has added new equipment such as EDM machines, heat treat ovens, vertical milling machines and CNC lathes to grow with its customers.

Over the years, Magnolia has found a niche in the automotive industry and the majority of its work is for automotive suppliers. Magnolia does not actually machine parts that go into cars but the tooling fixtures that make them. In fact, one customer who makes automated manufacturing machines has relied on Magnolia since its founding. In nearly 20 years, the company has expe-

rienced some good and some not-so-good economic times. Today, many of Magnolia's clients are so comfortable with their working relationship, they just send Jonathan a print, tell him they need it four times, to send a quote and to get started.

Challenge

While it is clearly an advantage to have a roster of satisfied customers, today's market is still competitive, and that puts pressure squarely on suppliers. A part can only be sold for the same money; so it's important to find a way to make it faster and less expensive.

At the same time, Jonathan knew for his business to move on to the next level he needed to invest in the future. When he took a hard look at his assets, he knew his vertical machines were getting old, were no longer very precise and showed increasingly more runout. The spindles on the older machines were only four-inches in diameter and thermal growth would have a negative

impact on part tolerances. The excessive runout they were observing meant reduced cutting ability and tool life.

For existing customers, Magnolia was spending precious time on getting it right. For example, typically Magnolia needed to turn a part three times during manufacturing for a customer. The process went like this: machine one side, turn it over, machine the next side, then turn it sideways and machine that side. Each time they did that, they needed to manually find the new reference surface. They were using feeler gauges and "johnny" blocks to confirm part placement and tool offset. The challenge was not only the slow manual setup, but Magnolia's older machines were not accurate enough and required creative and time-consuming workarounds. Jonathan and his team then worked towards the required dimensions. Then, using a stealth move Magnolia calls "sneaking up on the part", they would make the part larger than called for. They would then cut it a second time, check it and then cut it again until they had the right size.

A better way

"I have a friend with a shop like mine that uses Makino," Jonathan explains, "but he's a lot larger. What's funny is I actually trained him and then he started his own machine shop." Now in a turnabout, the former student is doling out advice to the teacher to help Jonathan to remain in the game. "One day he said, 'Look, Jonathan, you need to go with Makino. Their machines are really good.'"

And that comment jumpstarted Jonathan. In September 2015, discussions started with Tom Van Hersh, a Makino sales representative with Single Source Technologies. Van Hersh was upfront: No Makino machine unless Magnolia included the Blum-Novotest TC50 touch probe and LaserControl Micro Compact NT tool-setting laser. Recalls Jonathan, "Tom said, 'You can't realise your investment if you're going to continue an old-fashioned way of picking up parts and setting tools with jig blocks.'"

Magnolia built on another 2,400 square feet of space, bought one PS95 and two PS65 Makino machines, and basically started over. The two machines represented a significant spend for a small shop. Says Jonathan, "The results, however, were worth it. We never had that kind of automation and now," Jonathan notes, "I can't imagine how we ever made it without them."

Training and Support

Jonathan was also pleased with the technical support and training he received to run the lasers and probes. Edwin Kelfkens, a BLUM Systems Integrator, installed them on the machine. Next, Jonathan explains, "Edwin gave us a two-hour, step-by-step overview. After that, Edwin said, 'Okay, let's go to work.' "Once you get the basic concept of how to use that probe and laser it's easy," Jonathan explains. "If we put four new tools in the machine, you pull up a program to re-measure tools 4, 8, 10, and 12. It'll automatically get them, check them and you're ready in three minutes."

The BLUM probe reduces setup time of a workpiece in a machine tool and can also be used to verify dimensions once the workpiece has been cut. The touch probe determines the position of the workpiece within the coordinate system of the machine tool and stores it within the workpiece parameters in the control. The control utilizes



this information to determine the position and alignment of the workpiece in the machine.

The BLUM laser operates in the same way, but by using light to measure the tool while rotating at actual cutting speed. This reduces setup time for tools specifically and can also be used after a cut to ensure the tool is not broken or worn. Any change in length, radius or tool corner radius is automatically updated in the control, so accurate cuts are ensured.

Accurate results

Today, Magnolia simply eyeballs placement of the probe close to the part and the probe automatically confirms the part's location within seconds. "It's great," says Jonathan. "Now, when we make a part, it is perfect the first time. In one 10-hour day, three machinists might go through one to five different jobs each, the throughput times are fantastic."



The team of Magnolia Tooling in Batesville

The BLUM components are the new workhorses at Magnolia. The tolerance gets recorded in the program. If the TC50 probe senses a problem, it will stop the machine or fix it. "The tool setter can re-compensate the tool so we can go back and recut it to the right size. The probe won't let you make a bad part," Jonathan notes, "it takes all the human error out of the process."

Time savings of up to 40 %

Prior to integrating BLUM lasers and probes, jobs could take up to 11 hours to run. With the new Makino machines using BLUM part probes and tool setting lasers, Jonathan was surprised and pleased that they were able to knock four and a half hours off the total job. Bottom line: Magnolia was able to triple its capacity, delivering high-precision, small batch work to more customers.

More time, more jobs

With increased efficiency, Jonathan went on the hunt for more work and new clients. With the new machines in place, Jonathan's invited prospective customers to have a look. One of them, a maker of high-precision medical equipment, commented to Jonathan they had not seen many small shops with Magnolia's level of sophisticated equipment. "Once they looked at the shop and saw our machines had part probes and tool setting lasers, they said, 'We're going to give you a shot.'"

Now Jonathan is happy to share his experience. To those shop owners considering upgrading to higher-quality machine tools and automation systems, Jonathan concludes, "It seems hard to spend that much money to upgrade that far ahead, but if you have the work it will easily pay for itself in one year."

Production of the future

>>> www.fanuc.co.jp

We had the honour of meeting Dr Yoshiharu Inaba, Chairman and CEO of the Japanese FANUC Corporation. In conversation with Alexander Blum, President of Blum-Novotest GmbH, he discussed current trends and future developments in the field of production technology.

Alexander Blum: First of all, I would like to thank you for coming and that you are available for us today. I am very excited and I have prepared a few questions which might not be easy to answer but are very interesting for all of us.

"Hybrid and electrical vehicles", "additive production technologies", "Industry 4.0", "producing closer to the market" – many keywords here. Dr Inaba, what is your point of view regarding the development of metal cutting manufacturing on machine tools in the future? Is it a growing market, are there any new opportunities or is it a market full of risks?

Dr Inaba: The market is still growing and we know that the Chinese market is the biggest in the world in terms of the automotive industry. Then, after this boom, the market in India will follow, maybe within the next ten years. After India, Africa will be next big market. The demand for the automotive industry is still growing worldwide. As a matter of fact, hybrid and EV vehicles are changing the market, but still I think the automotive industry will need such machine tools for die applications and mechanical components for engine driving mechanics and suspension components. There are still many mechanical parts in automotive mechanisms. So, we need such a machine tool.

Alexander Blum: It is a growing market. Do you recognise changes and challenges or new fields in the market?

Dr Inaba: Yes, that's true. Because the number of engines will decrease as electric motors take over. But still, they need transmission or suspension mechanisms and many other mechanical components.

Alexander Blum: It's our experience as well. One of our fields is the production of test benches for gear boxes. Ten years ago, when the development of hybrid and electric vehicles started, we thought it might be dangerous. And now we are providing solutions to BMW or Mercedes for electric vehicles. The scenario has changed but the demand is still there, just in a different setup and we had to modify our approach to the market, and we did this successfully and it is moving on.

Obviously, FANUC is one of the leading global robotics manufacturers. Many of us are wondering in which direction the robotics industry will go? From your point of view, where will human services related robotics lead us in the next ten years? Far beyond the lifting assistance that is used in hospitals or similar features?

Dr Inaba: That's true. The market for manlike or assistant robots will grow and probably the market in these areas will be ten times higher compared to industrial usage. But FANUC is focussing on industrial usage only. We are not developing this human type or service robot.

Alexander Blum: Why not?

Dr Inaba: Because we are focussing on manufacturing technology, that means, automation and robots for the manufacturing area only, not for the medical area or home appliances, such as service robots. It is the basic policy of FANUC that we do not go into the home usage or service robot business.

Alexander Blum: Industry 4.0, Internet, IOT and the FIELD system of FANUC – the world is going digital in many aspects of life. Looking at the industry – what is a man/machine interface going to look like

in ten years' time when it comes, e.g., to programming and HMI? You have introduced the IOT which will bring a major change, obviously.

Dr Inaba: Yes, maybe in ten years' time we will be able to talk with robots or machine tools, so machine tools and robots will be more and more intelligent and sooner or later they can talk and will have communication capability.

Alexander Blum: Also human to robot and robots amongst each other?

Dr Inaba: Yes, right. You can suggest something to these robots in a simple way. At this moment, you need to make programs and teach them every detailed pattern of movement, but maybe five or ten years down the line you will be able to simply instruct them to operate.

Alexander Blum: Will it be a standard language like Siri that Apple uses?

Dr Inaba: You can talk in your language. Currently, we are trying to improve the performance of the individual robots or individual machine tools, but maybe in five or ten years' time we can start to think of overall performance, like a workshop, a factory or several factories. Because all robots and machine tools will be interconnected and also have artificial intelligence; deep learning technology will therefore give them the capability to create something or to think on their own.

Alexander Blum: I can easily imagine this in regard to robots having vector programming. But the NC control is still doing this in the background point to point. This would require a lot of data conversion to still operate in the background point by point, or do you also expect changes in the general approach?

Dr Inaba: Seeing as original data will come from the CAM system, the machine tools will be connected via the Internet and receive the necessary machine information, e.g. tooling, jig fixture or schedule. The system can then create a schedule and tool set, so they can plan by themselves, similar to a human operator. So, it will be very simple to give them a rough schedule, the target and CAD data as well as additional information. The system can subsequently analyse and transfer the job to each machine tool or robot just like a human operator. I think the entire factory will be one system and will autonomously execute manufacturing control processes which are currently controlled by human administrators.

Alexander Blum: If we take a look at the development of the machine tool market over the past ten years, we can see a clear trend away from simple standalone machines. On the one hand, the sales of on-board fully automated, multi-process, high-end machine tool systems are growing. On the other hand, machines like FANUC Robodrill have quickly gained a share in the market. These machines are series production units following modern industry standards. They have the characteristic feature of being easily integrated into mass production manufacturing lines or being integrated by both small and large engineering companies into automated manufacturing cells. In this context, they help by fulfilling a manufacturing job, including side processes like inspection, cleaning and packaging in one setup at low costs and making them competitive even in high-wage countries.

What further development of the market share do you expect to see in high-end solutions compared to production systems, as they are built with your machines? Is the market for highly-automated machines



Alexander Blum, President of Blum-Novotest and Dr Yoshiharu Inaba, Chairman and CEO of FANUC

costing more than \$500,000 growing stronger or will the solution you provide grow faster?

Dr Inaba: I think we can expect both directions. A simple machine can provide higher productivity, and a complicated machine can provide the capability to make very sophisticated parts without the need of a setup. So, once you have set up the material, very complicated parts can then be finished by just one machine. It depends on market needs, so there are two directions. Many people want very fancy products like smartphones; and smartphones, as you know, have a high-quality finish and the design is also good, but they are still mass-produced products. Everybody has the same one. But some people want a customized product, made exclusively for him or her. According to future demands, manufacturers will produce products based on a customer's individual taste. For this, you need very complicated machines, and the demand for these customised products will increase in the future.

Alexander Blum: We both agree that standard economic machines like your Robodrill and more sophisticated machines will have a greater share in the market. But this also has consequences for many machine tool manufacturers worldwide who produce rather simplified machines, which are difficult to automate. This segment will shrink in the future. I cannot see any other way.

Dr Inaba: That's right. Even such a simple machine will have automation and be more intelligent; this demand will thus continue in the future. As a result, simple machines without intelligence will disappear. Each machine will feature AI functions.

Alexander Blum: That brings me to my next question. The trend in production technology is leading towards fully automated self-compensating and controlling processes.

In the past, the process and application know-how in manufacturing was a core business part of machine tool manufacturers or their system integrators, like in the automotive industry. With the new processes, the focus and interaction with the machine tools have shifted towards the human machine interface (HMI). Rather than looking into the work area of the machine or the physical side, operators will have remote access and will no longer be standing next to the machine. You are introducing IOT as an HMI of the future for your controls. Could this be the starting point from where a control manufacturer has to take over more application and process know-how for the different industry fields from the machine tool manufacturer to fulfil end user requirements on its HMI? Or are we going to see a whole

new approach in how engineering companies source hardware from machine tool manufacturers, controls from companies like FANUC, turning this into production cell solutions for their customers?

Dr Inaba: We have always proposed this to the government, i.e. that we should increase the number of system integrators. In the future, we need more system integrators because machine tool builders or control manufacturers like us cannot provide system integration to all end customers. There are just too many end customers. We need a system integrator who knows both sides, the customer's requirements and the know-how of the control technology and machine tool technology. The system integrator can propose suitable systems to the end customer. Of course, big end customers like the automotive industry can produce their own systems. But Tier-1 or Tier-2 suppliers or job shops need the support of system integrators.

Alexander Blum: I also agree and always say that the system integrators are producing a kind of a black box, which is very sophisticated for the user. For the customer, it has to be very easy to use, as there are a number of parts to be made, and there is only a certain budget available for this. Then they need to find a respective solution for this.

Looking at our conversation, how do you see the development of production test and metrology solutions in these modern production processes?

Dr Inaba: Yes, of course, we always need sensors and measurement systems in the process. In the future, the machine tool or the robot will be more intelligent but will still need this type of measurement system to receive information, for example dimensions, noise, vibration or visual data. So, this demand will not disappear. We will always need a sensor, like a human being. We have the so-called five senses. Therefore, in the future, robots and machine tools will be closer to working like humans and will need something similar to the five human senses. Thus, they will require testing and metrology solutions.

Alexander Blum: I agree. Actually, what we see is a growing need for sensors because if you want closed loop processes, you should be in control of all the parameters of your processes. It makes a lot of sense.

My last question may be a little bit unusual. I have heard that you are interested in music. If you have to compare today's FANUC company and its direction to a style of music and/or a singer or band from the past, which or who would it be and why?

Dr Inaba: Probably the robot is a good player and machine tools are very good instruments. So, we would have an orchestra which would play a good symphony.

Alexander Blum: OK, symphony orchestra. Thank you very much. It was very interesting.

JAPAN





13 minutes at a scan speed of 1.8 m/min. During this time, the DIGILOG touch probe records 570,000 individual measurement values. However, only the linear axes are used during the scan so as to exclude any errors of the rotation axes used for production.

Software developed by Thomas Vujica allows for rapid inspection of the driveshaft. Using the network, the software adopts the measurement data recorded by the DIGILOG touch probe and generates a report including diagrams by way of illustration. The report provides a simple means of establishing whether there are deviations from the ideal form, and if so how big they are. This makes it possible to assess the manufacturing quality. The machine operator can keep track of the measurements on the PC as they are generated and differentiate between outliers caused by impurities and genuine quality issues. Also, the automated measurement technique avoids errors that cannot be prevented in the course of manual measurement.

Thanks to Blum-Novotest's DIGILOG probe, production today is backed up by reliable quality assurance, the delivery times are significantly shorter and the production department can be sure of fulfilling the required gearing quality. In fact, it is possible to manufacture and dispatch a driveshaft within a single day if necessary. Previously, such times were unthinkable; the measurement process alone took two to three weeks. This is extremely valuable in a sector in which customers depend on absolute reliability. So Thomas Vujica is able to draw a positive conclusion: "The cooperation with BLUM and the internal specialist departments was excellent. We developed the measuring sequence together, optimising it steadily and integrating it into the process. Thanks to the DIGILOG touch probe we now have a very fast and reliable manufacturing process that means we no longer have to rely on the old special machines for this component. It also enables us to achieve high economic viability and shorter response times. What more could one ask for?"

>>> www.schulergroup.com

Perfecting tooth interlocking

What can be done when the production machines for an essential component have been discontinued and the process simply takes too long? At Schuler Pressen AG, the decision was taken to find a new solution: producing gears using profile cutters. This is where Blum-Novotest's TC64-DIGILOG scanning touch probe came into play: it enables examination of the tooth interlocking and ensures that the process as a whole is consistent and verifiable.

At Schuler AG, gears for large press driveshafts have only been produced with the aid of special gear cutting machines in the past. These machines exhibit good repeatability characteristics, but the time taken to manufacture a driveshaft is very long. Shaping the gears alone takes between 16 and 19 hours. Moving the parts weighing nearly 700 kilograms between the various processing machines was also complicated and contributed to the long production times.

As the tried-and-tested machines were no longer available on the market, Schuler Pressen had to find other ways of tackling the production bottlenecks that were looming. The solution came in the form of milling the driveshafts on a modern turning/milling machining centre using a specially manufactured profile cutter, together with carrying out measurements in the machine itself. "Previously, we had no way of directly measuring the form deviations of the tooth flanks," explains Thomas Vujica from the production planning and NC programming department. "That was not required with the gear cutting machines, in fact, because they are

constructed in such a way that there is always an involute. The question of measurement only became an issue when the gear production migrated to the turning/milling centre." A workaround was found that involved transporting the heavy driveshafts to another company where each individual shaft was measured on a special measuring machine. However, depending on order backlogs and waiting times, that took two to three weeks. And that cancelled out the advantage in time that the milling technique brought with it.

The solution found by Schuler Pressen was the Blum-Novotest TC64-DIGILOG touch probe. The advantage of the DIGILOG touch probe is that it can carry out both digital measurements as well as analogue scans. This means that it is possible to guide the probe over a surface and register measurement data continuously.

The complete measurement of a cogwheel consists of 144 individual measurements on a slanted track along the whole tooth flank – 36 teeth with two flanks each, and in both halves of the double helical gear. The complete measurement procedure only takes





New subsidiary in Spain

Blum-Novotest has had its own representative office in Spain since the start of the year. Managing Director of the new company called "Blum-Novotest Ibérica, S.L." is Miguel Moyano, an experienced sales engineer. The new subsidiary in Ermua, a town located in the province of Biscay near Bilbao, will serve local customers and support field staff and system integrators (retailers with service operations) in Spain as a local sales and service centre. "Local presence helps to further strengthen the strategy of maximum customer support and optimum service while enhancing our commitment to supplying high quality solutions to customer specific requirements," explains Alexander Blum, President of Blum-Novotest GmbH.



The Business Divisions



Measuring Components

The division of Measuring Components develops and produces high-quality measuring technology for machine tools. We offer laser measuring systems and probes for tool setting and monitoring, touch probes for workpiece and tool measurement, as well as sophisticated probing software for comprehensive production control during initial setup.



Measuring Machines

The division of Measuring Machines offers state-of-the-art, well-proven solutions for dimensional or geometric measurement and crack testing mainly for rotation symmetrical parts in the automotive industry and its component suppliers. Furthermore, we are a capable partner for your individual measuring and testing demands.



NOVOTEST Test Engineering

NOVOTEST is the Test Engineering division of Blum-Novotest GmbH. The business division specialises in test stands for automotive and hydraulics industries. The scope of supply and services incorporates planning, design and manufacturing of test stands for function, endurance and lifetime testing as well as the integration into the automated systems of our customers.



Blum-Novotest GmbH is a pioneer and innovation leader in the field of top quality measuring and testing technology. The ultra-modern, yet down-to-earth feel of the company has also been reflected by its new-look website since the start of 2017. The new homepage needed to be user-friendly, informative and concise – and it checks all of these boxes.

Responsive design

To accommodate the rapidly growing number of mobile users, websites have to be designed for device-independent communication. A website with a "responsive web design" is able to fully adapt to the screen it is being used on, regardless of whether it is a desktop PC, a tablet or a smartphone. To guarantee our new web design looks great and functions correctly across all devices, we chose a responsive design for our new website – dynamic, accessible and sustainable.

High degree of transparency

Due to the high technological importance of our products, a face-to-face meeting with our sales team is necessary to determine the most appropriate measuring technology for your specific needs. However, you can take a look at our user-friendly website in advance to get an impression of what our products offer you. Complex technical information is explained easily with embedded videos in HD quality.

Clear and concise download section

Once you have found a suitable product, simply download PDF files containing further technical information about the respective product from our extensive and clearly structured download section. The product brochures are available in 13 languages. Localisation is a key feature of the entire website – discover your local contact in Europe, America or Asia!

Service & Workshops

Find out about available services and training events on the wide-ranging pages of the respective business division. You will additionally find information about available original accessories. Upcoming dates and an easy-to-use form for registering for one of our many workshops are also available on the new website. Find out more about free workshops at our Tech-Centre in Grünkraut, Germany!

Careers with Blum-Novotest

Current vacancies and information about apprenticeships, trainee programmes and internships can be found on our new-look career pages – complete, concise and informative. Discover the benefits that Blum-Novotest offers its employees and take the opportunity to develop personally and professionally with us. Discover more about our interesting job offers from R&D, production and sales to service, administration and logistics – worldwide!

News & Trade fairs

We take part in almost 50 international trade fairs each year. Current trade fair dates, halls and stand numbers are clearly listed month by month on our new website. We look forward to meeting you at our stand and getting to know you personally! Besides all the latest news about the company and its products, the News & Stories section offers numerous user reports on existing applications. Be inspired!