MPS Microsystems – an innovative company

In a resolutely high-tech environment, with a sleek modern aesthetic and atmosphere conducive to friendly, informal exchanges, a team of five from MPS Microsystems shared their enthusiasm and their initial experiences following the arrival of the Bumotec s191H machining centre to their workshops in Bienne.

The MPS group is a producer of components for the medical, automation and optical systems markets; they also work for the watch sector and for the science industries, in niche markets such as large telescope production. MPS Micro Precision Systems AG comprises four different entities: MPS Precimed, MPS Watch, MPS Décolletage and MPS Microsystems. The latter company recently acquired its first Bumotec s191H, now at its site in Bienne, which employs 200 staff.

Plant Manager Manuel Nercide, explained the company's philosophy to us. "Our design office takes the customer's requirements or an existing drawing, and uses this to develop or suggest a design for a reworked workpiece. Our production and assembly workshop then takes over to manufacture the components, before a complete finished product is delivered to our customers."

Historically, the company's main activity has been the manufacture of high-precision ball bearings. This activity, requiring expertise in precision down to 1/10th of a micron, has been retained and developed to guarantee the operation of the assembled systems. The standard products in the linear ball bearing ranges are available online on a dedicated web platform. For more complex products, close adherence to a relatively precise set of specifications is essential.

After in-house consultation, the Bumotec s191H was the obvious choice

Manuel Nercide: "With the miniaturisation of equipment, ensuring precision becomes an increasingly important factor, whatever the application may be. However, other requirements must be taken into consideration, such as the surface finishes obtained and the repeatability of the manufacturing process over time." One of the company's strengths is that the parts it produces are renowned for their reliability, precision and consistency. This is the result of the balance between skilled human resources and the production solution equipment.

Nicola Thibaudeau, CEO

"The MPS vision is to offer its customers high quality production of complex products with high added value."

MPS: a group offering a broad range of solutions adapted to different markets

Manuel Nercide: "The arrival of the Bumotec machining centre coincides with the development of our milling process requirements, which is something we have been doing in-house since 2016. The aim of this is to achieve a certain level of independence when it comes to suppliers, by being able to subcontract within the group's own entities."

By manufacturing a machined part from bar stock, and incorporating not only the turning and milling operations but also the grinding step, the Bumotec allows productivity to be improved by creating very high quality parts using a single clamping set-up. The result is significantly fewer rejects during production, shorter set-up times and an automated system which can be used to manufacture around the clock without any human intervention. The machine inventory at MPS already allows turning, milling and finishing operations to be performed, but on separate production equipment, and from blanks. In terms of investment, the aim was to provide added value compared to the solutions currently in use. Potential suppliers are selected after an analysis of requirements and of the work produced to date, alongside any forthcoming product developments.

Manuel Nercide: "The final choice is made jointly with the technical department and the machine operators. The Bumotec machining centre was chosen because it met every single one of our expectations in terms of both technical possibilities and the user-friendliness of the HMI. The manufacturing details, and Starrag Vuadens' specific expertise in scraping to ensure a high level of precision is achieved, were key. The excellent level of collaboration and the speed of the support provided throughout the project only served to confirm our choice."

Manuel Nercide,
Plant Manager

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Monitoring the project and the training of operators are fundamental factors

Milling engineer Lucas Vorpe went to Starrag in Vuadens to complete training on the Bumotec s191H. "The machine interface is so intuitive that I was able to program my first workpiece directly." The "test" component used to help MPS choose the selected machine supplier was a part used in the manufacture of telescopes. It is designed to be fitted on an actuator. The fibre optic is attached to this part located at the end of the assembled system, and allows it to be oriented. Depending on the size of the parabola, every telescope which scans the galaxy comprises between 200 and 1.000 actuators.

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Head of production, Michael Bazzan: "The target cycle time for the part was 30 minutes; the Bumotec s191H created it in almost a third of this time: twelve minutes." Michael Bazzan shared the team's excitement for the Bumotec s191H machining centre with us. "The Bumotec s191H really stands out in the production workshop. With a modern design and contemporary colours, this latest addition has one feature which immediately united the machine operators: the user-friendly interface. Simple to use, with clear information, the controls are highly intuitive." Producing from bar stock is also something very new for MPS. Thanks to the built-in bar loader, blanks no longer need to be prepared by machining their attachment systems prior to production.

A team motivated by its choice of new production solutions

Michael Bazzan: "Our productivity has increased now our production process no longer involves clamping workpiece after workpiece for machining, then using multiple fixtures to create the finishes. All the operations are performed in turn using the same clamping set-up, without any interruption."

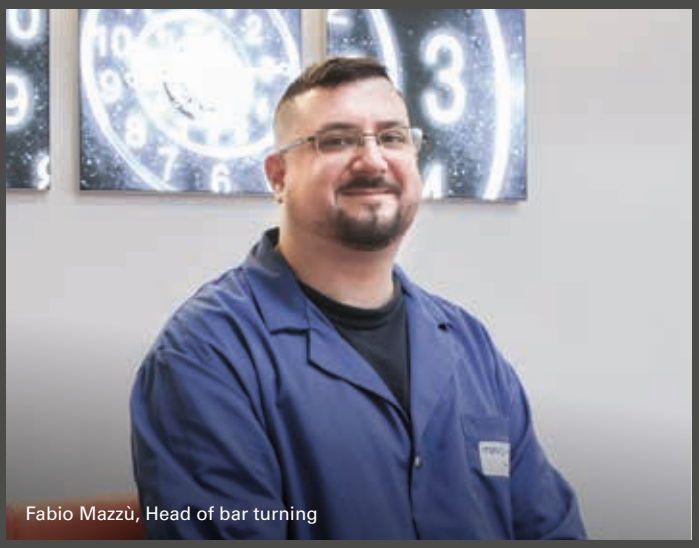
Fabio Mazzù, head of bar turning, milling and EDM, added "We can also leave production running overnight without supervision thanks to the function which manages the sister tools in the 60-position magazine." With this function, if a tool breaks during production, it is replaced with an identical tool stored in the magazine. There is no need to stop production and the tools are tested.

The ability to machine complex materials is one of the Bumotec s191H's assets

MPS Microsystems is an innovative company developing innovative solutions. One of the most high-tech projects with a global impact that the Bienne-based company has been actively involved with is the machining of components for an artificial heart. As Michael Bazzan explained to us, "this was an enormous technical challenge as the part we needed to produce for this project is a component made from carbon-filled peek with geometric and dimensional tolerances of just a few microns and exceptional surface finish requirements. The chosen Bumotec machining centre is perfectly adapted to this type of challenge." The machining of components on six faces using the retaking unit once again allows the entire part to be manufactured in a single clamping set-up.

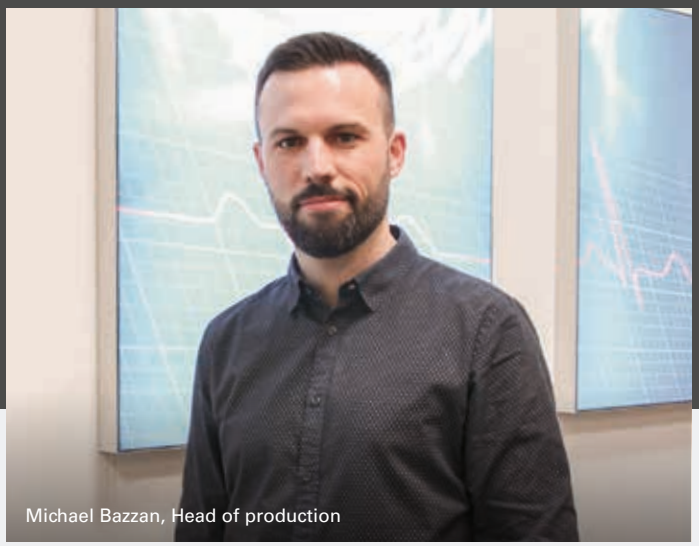
Michael Bazzan: "In concrete terms, we are at the industrialisation stage for this artificial heart project, and the components to be produced are very challenging. The Bumotec s191H allows us to overcome these issues."

In the medical industry, the traceability of components and their documentation are very widely referenced, particularly when it comes to implants of any kind. The procedures are usually quite long and costly. Limiting the number of operations



Fabio Mazzù, Head of bar turning

> "The collaboration with Starrag Vuadens has enabled us to take a huge step forward in the process to internalise key competencies."



Michael Bazzan, Head of production

Lucas Vorpe, Milling engineer

performed on different complementary production units, and therefore using a single fixture for machining, also allows these procedures to be shortened and simplified and their costs reduced. Michael Bazzan gave a concrete example of the simplification of the work flows: "With a component created on three complementary production units, we have to prepare three different fixtures and three set-up files, along with three procedures and three tasklist operations, whereas during production with the Bumotec s191H, one single set-up file has to be prepared with a single file of tasklist operations. Obviously these are much larger, but they are simpler to manage as we have just the one document to monitor."

For future projects with the Bumotec s191H, the main materials to be machined will be titanium, stainless steel, aluminium, and the carbon-filled peek mentioned previously, plus of course, ceramic if a demand for this arises. Fabio Mazzù: "The power of the spindle which rotates at 40,000 rpm brings benefits both in terms of surface finish quality and cycle time, something which our current inventory of machines cannot provide as their spindle speeds are limited to 20,000 rpm."

Proficiency in key competencies such as milling

This investment in the Bumotec s191H is part of a program to gain in-house proficiency in key competencies, as Nicola Thibaudeau, CEO explained: "For us, control of the milling process is a necessary key competency for successfully creating increasingly complex parts and ensuring a higher return. The collaboration with Starrag Vuadens has enabled us to take a huge step forward in the process to internalise key competencies."

The MPS vision is to offer its customers high quality production of complex products with high added value. Today's markets are highly reactive. Manufacturers need to be able to change production very quickly, in line with demand. Each change in production needs to be accompanied by the shortest possible set-up time to maintain a high level of productivity. To a greater extent than is the case today, production runs may be for very small volumes of increasingly complex parts. The production tools will have to reflect this trend. Here again, the Bumotec s191H is sure to deliver on its promises.

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