



Success Story

High-performance stock removal

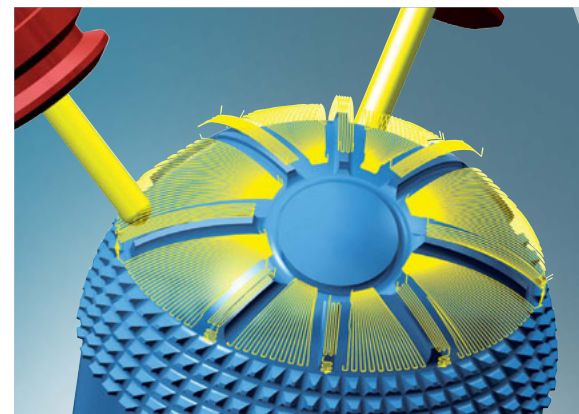
Jossi Orthopedics AG, based in Islikon, Switzerland, is a leading manufacturer of orthopaedic implants. The interplay between all areas, from development right through to series production, delivers workpieces that are in demand...

...all over the world. Jossi Orthopedics relies on *hyperMILL*® from OPEN MIND Technologies AG to create CAM programs.

People need orthopaedic implants when their body aches or when joints are damaged due to an accident or other cause. These products are state-of-the-art, high-tech developments that allow patients to become pain free and restore as much mobility as possible. Manufacturers of workpieces and systems like this work directly for patients: These products are not luxury goods. Manufacturers have to work with complex geometries and challenging materials such as titanium alloys, cobalt-chromium and high-alloyed steels. Jossi Orthopedics AG, based in Islikon, Switzerland, has mastered the materials and all of the processes required to machine them. The company's roots date back to the founding of Hans Jossi Präzisionsmechanik in 1957. Hans Jossi manufactured various kinds of parts and mechanisms and quickly made a mark through his ability to machine challenging geometries and materials.

titanium was not practically suitable for reshaping. Nevertheless, Hans Jossi and his team managed to develop a process for the deep drawing of titanium," says Dr Martin Schmidt, responsible for the International Markets segment at Jossi. This process made it possible to save a lot of money compared with complete machining from solid stock. Around 70 per cent of costs involved in the Jossi process are lower than for pure machining (material costs and processing costs). This created a competitive advantage, which led to a decision to start manufacturing implants.

Among other things, Jossi built robust, durable presses and received a request in the 1970s regarding whether it would be possible to reshape titanium. "At that time,



About JOSSI Orthopedics AG

JOSSI Orthopedics AG produces components for orthopaedic implants, trauma surgery and corresponding surgical instruments. Its customers include well-known manufacturers of medical technology products. Thanks to its wide range of services and expert, closely-networked employees, JOSSI Orthopedics implements complex projects in next to no time and produces its products efficiently. The quality-related organisational elements are oriented towards and documented according to ISO 9001 and ISO 13485.

> www.jossi-orthopedics.ch

“*hyperMILL*® came out on top on the end, as it provides simple and efficient operation during 5-axis programming.”

Midhat Dedovic, Head of Multi-Axis-Manufacturing at JOSSI Orthopedics



The partners in Islikon:
Dr Martin Schmidt (left) and Midhat Dedovic.

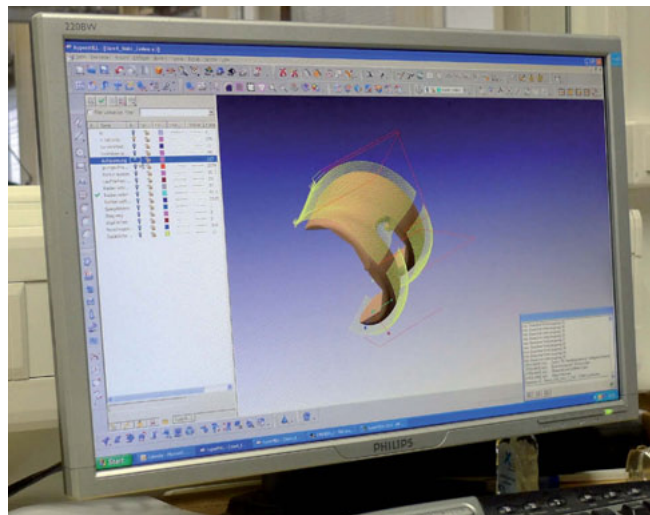
Today, the Jossi Group employs around 200 people and is divided into Jossi Orthopedics AG, Jossi AG and Jossi Systems AG, under the umbrella of a holding company. Jossi Orthopedics produces components for orthopaedic implants and corresponding surgical instruments. “We define ourselves as a pure supplier. The products always carry our customers’ name, and they are all well-known orthopaedic companies,” says Dr Martin Schmidt. On the one hand, the Swiss specialists work according to customer specifications, and on the other hand, they continuously offer new manufacturing technologies and solutions. “Our comprehensive expertise, command of the processes and use of the latest tools allow us to undercut competitors by a factor of three when it comes to the production time of parts,” says a proud Dr Schmidt. *hyperMILL*® from OPEN MIND Technologies AG, located in Wessling in Upper Bavaria, contributes to this competitive advantage in the CAM area.

Easy to use

hyperMILL® allows users to program any type of machining – 2.5D, 3D, HSC and 5-axis milling, as well as mill turning – from within a standardised user interface. After all, there are hardly any modern components that require only one type of machining. It is worth pointing out that the user is presented only with options that are task-oriented, practical and safe, instead of every imaginable configuration. This is one of the main reasons that users are able to progress so quickly.

CAM workstation with *hyperMILL*®:

The workpiece belongs to a knee joint.



A further speciality of *hyperMILL*® is the ability to machine with indexed axes. 5-axis machining is not about performing ‘funny movements’, but about milling profitably. And that can be achieved if a job is executed with as few movements as possible. In this process, *hyperMILL*® automatically indexes the axes that are not required. Machining continues simultaneously only on those axes where this does not work. Among other things, this process also reduces wear on the machine.

This list would not be complete without mentioning OPEN MIND’s feature and macro technology, which enables the user to standardise and automate the programming of geometries.

Broad spectrum of machining strategies

Jossi Orthopedics also uses turn-mill centres from Mori Seiki and a large number of machining centres from Hurco and Hermle to machine implants and tools. In order to find the best possible CAM system for their programming needs, it was necessary to undertake a selection process that also reviewed two other CAM systems under consideration. “*hyperMILL*® came out on top in the end, as it provides simple and efficient operation during 5axis programming,” reports Midhat Dedovic, Head of Multi-Axis Manufacturing at Jossi Orthopedics.

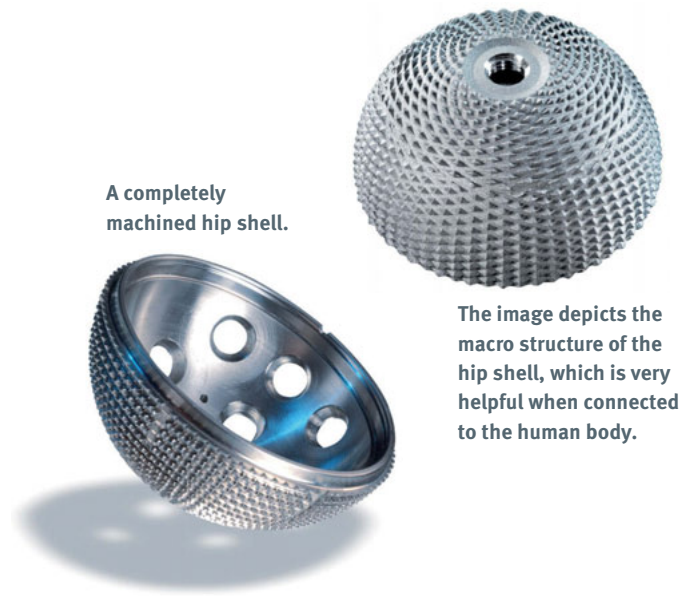
There are now two *hyperMILL*® workstations in use for manufacturing and another one is used to train apprentices. “When it comes to the two production workstations, we use everything the system has to offer, apart from the special applications,” explains Midhat Dedovic. This results in a solution that the machines can optimally exploit for every type of part, thus contributing to the short manufacturing times mentioned earlier.

Jossi uses the tool database contained in the CAM software as much as possible. It makes it possible to completely import tools, define individual tools and customassemble complete tools including holders. In addition to the material-specific cutting data, users can also create various profiles for each tool defined in the database. This way, different applications can be predefined and then selected in the job steps – even for the same workpiece and cutting materials.

To simulate the CAM programs, Midhat Dedovic and his colleagues stored the Machine models in the CAM system. This way, it is possible to check the programs created, either in terms of the toolpaths created or in terms of complete workspace and machine monitoring. “We alternate in this respect,” says Dedovic. “For 5-axis programs, we perform collision checks directly during programming. For 2D paths, the check is performed at the end as part of the complete simula-



A revision shell from Jossi Orthopedics, developed using deep drawing and machining.



A completely machined hip shell.

The image depicts the macro structure of the hip shell, which is very helpful when connected to the human body.

tion.” The CAM experts use existing simplification and acceleration options, for example, by copying jobs or the entire job list. There are five sizes for the components for knee joints, for example. When it comes to the job, Size 4 is identical to Size 5. Here, copying the job list helps the user to progress quickly.

“We also use automatic feature recognition to speed things up,” explains Dedovic. Automatic feature recognition detects geometries from solids and surface models, such as holes, stepped holes with and without threads, as well as open and closed pockets. Parameters are automatically generated that are required for the programming of machining strategies and

for tool selection. Jossi Orthopedics uses this advantage when it comes to inserting holes on freeform surfaces that can be placed anywhere, for example (see product photos). The automatic feature recognition guides the user to the target much faster.

Summary

The experience that Jossi Orthopedics has had with *hyperMILL*[®] and OPEN MIND has been very positive: “I’m fully satisfied with the product, so much so that I can say that I don’t want to use any other CAM system,” says Midhat Dedovic. The company also rated the support provided by OPEN MIND, both from Switzerland and the head office in Germany, as excellent. ■

About OPEN MIND Technologies AG

OPEN MIND is one of the world’s most sought-after developers of powerful CAM solutions for machine and controller-independent programming.

OPEN MIND designs optimized CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2.5D, 3D as well as 5-axis milling/mill turning, and machining operations like HSC and HPC are efficiently built into the *hyperMILL*[®] CAM system. *hyperMILL*[®] provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

OPEN MIND strives to be the best and most innovative CAM/CAD manufacturer in the world, helping it become one of the top five in the CAM/CAD industry according to the NC Market Analysis Report 2015 compiled by CIMdata. The CAM/CAD solutions of OPEN MIND fulfil the highest demands in the automotive, tool and mould manufacturing, production machining, medical, job shops, energy and aerospace industries. OPEN MIND is represented in all key markets in Asia, Europe and America, and is a Mensch und Maschine company.



We push machining to the limit

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