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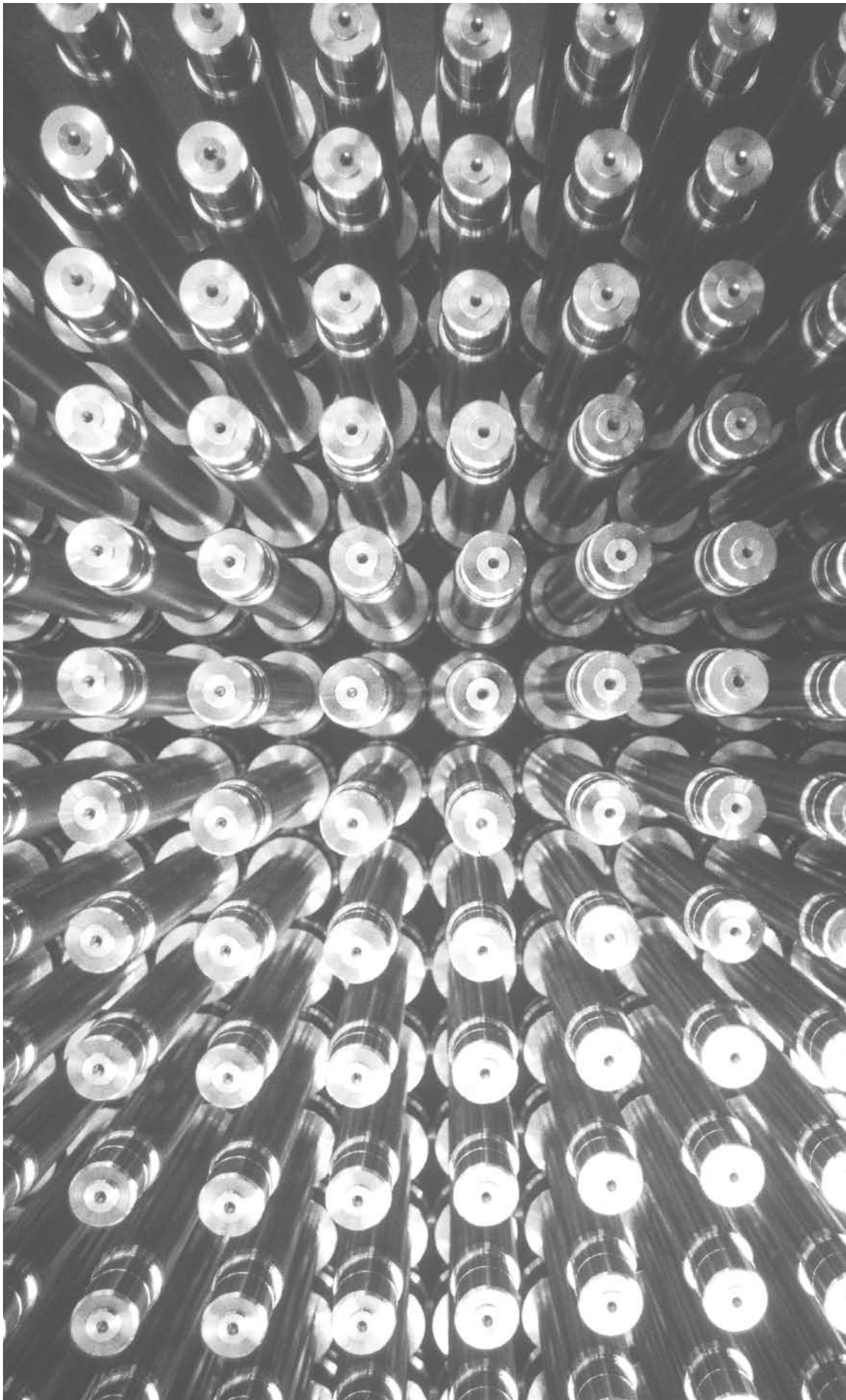
New Machine Concept is a Breakthrough



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New Machine Concept is a Breakthrough

Ready-made complex handle sleeves for dental instruments

INDEX is introducing a new generation of turning/milling centers – the R200. Two motorized milling spindles, in two independent sub-systems, will enable extremely short production times per piece, even for complex, difficult-to-cut workpieces. Use of an R200 in parts production for dental technology company Leutkircher illustrates this concept in the field.

Author: Holger Röhr

Klaus Kohler, Operations Manager at Sycotec: "With the R200, we have found a machine that meets our needs perfectly."

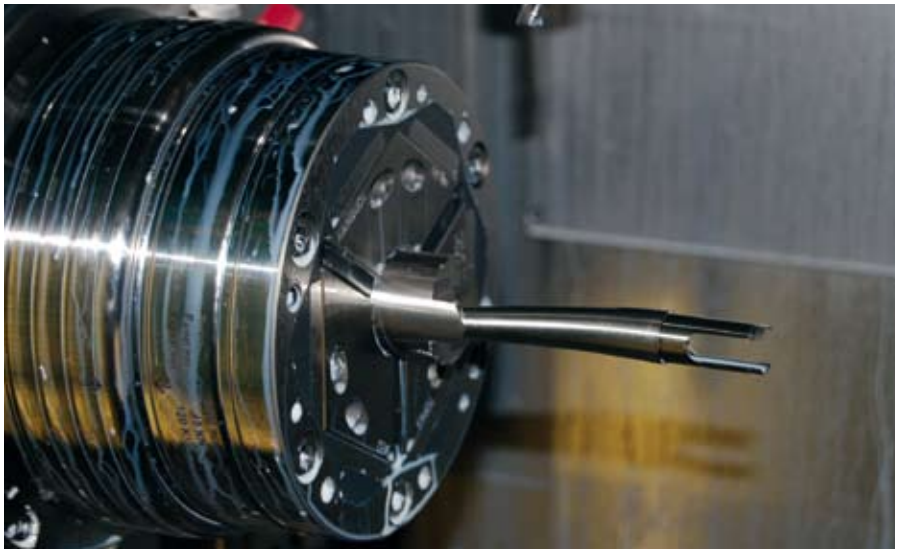
The order that was offered to Sycotec was promising. Handle sleeves for dental drills were supposed to be produced in recurring batch sizes. The challenge: The narrow part had to be completely drilled out from the inside and equipped with connecting surfaces that were free of transitions. A free-form surface of high-quality finish was required on the outside. Even the material was not exactly easy to machine – a high-alloy stainless steel that had to be cut under difficult conditions. It was the precise requirements for the surface quality that were so challenging; because, except for a blasted and electroplated surface, there was to be no additional machining on the design surface of the part after turning/milling. Additionally the target for the cost per piece that proved to be a particular challenge.

Initially, a prototype of the part was produced at Sycotec in several steps – an extremely time-consuming process that was inefficient.

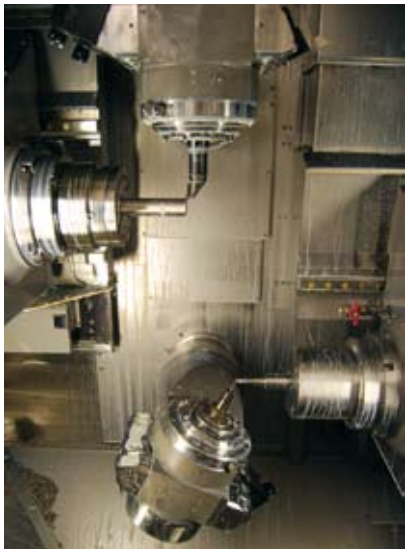
Klaus Kohler, Operations Manager, and Robert Heinle, Head of Base Production at Sycotec, along the people at INDEX, considered what could be done to meet the requirements. It turns out that INDEX was working on a machine concept that was predestined for this part, the R200. The requirements of Sycotec came about at exactly the time at which the R200 was supposed to be used on a trial basis with specific customers.

New machine concept being produced for industrial trials

This is how it came to be that Sycotec was along for the ride from the start; the company followed the development of the R200 and was one of the first companies that was able to test the new machine under production conditions. In doing so, the special qualities of the R200 concept with the two independent working areas were quickly proven. The machining tasks for the part were handled perfectly. Drilling operations and connecting surface and roughing machining are handled



A sophisticated part: The ready-made handle sleeve of the dental instrument is machined at Sycotec.



Perfect distribution thanks to two independent working areas.

on the first spindle, while primarily the high-quality free-form surface is created on the second spindle. With the R200, the previous cycle time of the alternative machine concept was cut in half after a brief run-in period.

Robert Heinle, Head of Base Production at Sycotec, is very happy with the function of the R200. The combination of a Siemens 840D control and the proprietary INDEX input surfaces has proven to be optimum in the field.

Hans-Joachim Stumpf, INDEX Regional Sales Manager, Jan Hroch, INDEX Technical Sales Manager, Klaus Kohler, Sycotec Operations Manager, and Robert Heinle, Head of Base Production at Sycotec (from left), have all helped make the new R200 machine concept a success.

Handle sleeve of a dental instrument: The air-driven instrument reaches speeds of 400,000 rpm.

Required surface quality in a reliable process

Robert Heinle is also satisfied with the new machine: "Merely the fact that the required perfect surface quality is achieved with an absolutely reliable process speaks for the machine concept. Even though two parts are machined simultaneously, in which one is rough-machined while the other is going through fine-finishing, there are no offsets or inaccuracies in the surface structure. This proves that with the R200 machine concept, it is possible to effectively separate, from a vibration perspective, the two part systems. All of the required tolerances were also maintained without any problem. And what was particularly important from our perspective was that we can economically produce the part in the required batch sizes on the R200." In addition to the two independent part systems, machining also profited from the powerful motorized milling spindles in conjunction with a very fast tool change that accomplished the 25 tool changes per part in a chip-to-chip time of 4 seconds.

Customer is planning increased output

The customer is satisfied with the quality and the price and has already indicated that quantities will be further increased. At that time, it is probable that fewer different parts will be produced on the R200, because the machine is already running three shifts a day. With 80 tools in the magazine, there is sufficient space to accommodate tools for multiple different parts. Very few personnel are required to operate the machine due to the cycle time of the part. The part is removed and placed into position using a portal gripper. The employee then only has to check the dimensions and tolerances. In this manner, one employee can operate two to three machines.

Machine ideal for a broad application spectrum

Hans Joachim Stumpf, the current INDEX Regional Sales Manager, stresses that the application area of the R200 is in no way limited to the machining of high-end parts: "The R200 is suited to a very broad parts spectrum. Two parameters must be within a certain range: the complexity of the part and the batch size. The R200 can perform the work of a turning center of average complexity but can also be used, with the maximum equipment level, as a high-end application with doubled machining in five axes. Field trials have already shown that there are many applications in which the R200 can replace conventional turning centers."

The INDEX R200 turning/milling center cuts productively and flexibly in two independent subsystems – and it can do it in 5-axis machining.

... Sycotec info

High-tech company Sycotec, which is headquartered in Leutkirch in the Allgäu region, was established in 2006 from EWL-Werk, part of the Kavo Group. The 350 employees have been developing and producing innovative drives and equipment solutions for industrial applications for more than 50 years and are original equipment manufacturers for dental products. With their products, Sycotec is considered to be one of the leading manufacturers in the world in many sectors. Sycotec products are used in the dental and medical technology fields, with tool machines, in precision mechanics, and in the aviation industry. The activities of the family-owned business are divided into three areas: Dental Equipment (drives and equipment solutions for dental and medical technology), Drive Systems (electric drive solutions for industrial applications), and Components (production of complex components and parts).

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