

## “THE PRICE IS THE DECISIVE ARGUMENT”

THOMAS BECHTOLD IS HEAD OF THE CNC MILLING DEPARTMENT WITH THE GERMAN COMPANY GENTHNER SYSTEMTECHNOLOGIE; RONNY RETZLAFF IS HIS COUNTERPART FOR WATERJET CUTTING. IN AN INTERVIEW WITH BYSTRONICWORLD, THEY EXPLAIN THE ADVANTAGES OF COMBINING THE TWO CUTTING PROCESSES.

Interview: Martin Engel, Photos: Berthold Steinhilber



Thomas Bechtold (left), Head of CNC Milling, and Ronny Retzlaff, Head of Waterjet Cutting at Genthner SystemTechnologie.

**BystronicWorld:** Mister Bechtold, at Genthner waterjet cutting is used to support the machining production. Why as Head of the CNC Milling Department does this make sense to you?

**Thomas Bechtold:** Because it pays off financially for the company. And if something is worthwhile then one must do it. Furthermore, we are even more competitive with waterjet cutting since in many cases we can offer more favorable prices and shorter delivery times.

**B.W.:** What do you mean by “in many cases?”

**Th.B.:** Ten percent of our milling orders are executed with the aid of waterjet cutting, of these some

20 percent exclusively. With the other 80 percent, only the work that cannot be done with waterjet cutting is executed in milling.

**B.W.:** What properties must the parts have so that they are basically suitable for processing using a combination of waterjet cutting and milling?

**Ronny Retzlaff:** The geometries must be formed in a way that the parts are easy to nest so that finally a minimum of scrap remains and we can hence save on material compared with milling. Complex shapes are also ideal since waterjet cutting is extremely flexible and hence also fast. Every contour is cut using the same tool so that retooling and

*“Ten percent of our milling orders are executed with the aid of waterjet cutting.”*

Thomas Bechtold, Head of the CNC Milling Department



reclamping are omitted. Thus we save time and consequently money. What basically isn't worthwhile is the cutting of simple square blanks. In such cases one is better off ordering these from an external job shop that can cut them using a saw more quickly and cheaply.

**Th.B.:** Another factor is that with milling we often have to use material that is up to 50 percent thicker in order to be able to chuck the part. We then need additional working time later to remove the excess material by chipping. Let us consider, for example, the side wall of a medical device that is manufactured by us. It's a sort of U-shaped

frame with a square base. From the inside of this square a polygonal contour is cut out. In this frame a series of holes, threads, and pockets are formed in order to be able to connect it with other parts and components of the device. If one were to produce this part using milling alone, there would be a high usage of material since the contours that are cut out produce waste. Secondly, with this part two chucks are necessary, one of which is quite complicated. If, in support of the milling, waterjet cutting is used, we have far less waste and the complex chuck isn't required. In the case of this particular part, between 95 and 98 percent of the

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## The ByJet Pro Waterjet Cutting System – Performance at Its Best

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Perhaps the most outstanding feature of the ByJet Pro waterjet cutting system is its unmatched productivity: thanks to the four cutting heads and the unique shuttle table concept, this machine is capable of producing up to five times more parts per unit time than a conventional single-head machine. The high-quality machine construction of the ByJet Pro ensures the highest possible sustained accuracy and since unlike the standard machines available on the market the system is encapsulated, a clean and low-noise working environment is also assured. Furthermore, the ByJet Pro can be tailored precisely to the customers' specific production requirements, since the system is available in a number of variants. Hence all orders, from single-unit production right through to large series, can be cost-efficiently produced across an almost unlimited spectrum of different types of material.

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*“Thanks to the shuttle table of the ByJet Pro we save at least 30 percent time.”*

Ronny Retzlaff,  
Head of the Waterjet  
Cutting Department

work can be done using waterjet cutting. Only the holes, which do not go right through the material, and the pockets that are subsequently milled out. Additionally, we cut the threads in the holes that were also already prepared during the waterjet cutting. This work can be carried out simply by chucking the part in a vice.

**B.W.:** How would you quantify the savings with the part you just described?

**Th.B.:** Overall this part costs us about 30 percent less. Of this around 20 percent result from the material saved, which with a series of 50 parts amounts to about 2000 euros. The remainder falls to the omission of the complex vacuum chuck. Furthermore, I gain a significant amount of capacity on the milling machines thanks to the outsourcing of the work.

**B.W.:** At the beginning you mentioned that you're also able to achieve shorter delivery times as a result of combining waterjet cutting and milling. Let's say I were to order some of the side walls described above. How quickly would you be able to deliver them?

**Th.B.:** If we use milling only, we must first wait three to four days for the blanks. Furthermore, because of the two different chucks, with this part we need two different milling machines. Using waterjet cutting as a preceding process, we can supply within four working days, because the almost completed parts are delivered to us by the waterjet cutting department within a maximum of two days, and for the final work we estimate a further two days.

**B.W.:** When designing their parts, can potential customers consider certain things so that they can take advantage of the benefits of waterjet cutting?

**R.R.:** Yes, most certainly. Inasmuch as, for example, already during the design they work with toleranc-

es that we can also maintain with waterjet cutting. Here we're talking in terms of an accuracy of plus/minus one tenth of a millimeter, which can easily be achieved. And it has to be accepted that the surfaces are not as shiny as with milling but, due to the abrasive material used, are slightly roughened. In practice, the design engineers often assume that the parts will be milled and specify accordingly narrow tolerances on the drawings that, however, in practice are simply not required. And the non-shiny surfaces are very often also not a problem because the part is hidden anyway or is lacquered. Furthermore, if it's possible to optimize certain contours during the design phase specifically for waterjet cutting, then one can once again save money, and in fact the thicker the material is, the more can be saved, in particular with stainless steel. Let me give you an example: We cut a flange out of a rod that was later to be milled. The height was 120 and the diameter 150 millimeters. We approached the customer and asked whether it wouldn't be possible to increase the diameter slightly, since the larger it is, the faster the machine can travel and the cheaper the part will become. Through this measure we reduced the cost of the part by around one third. The customer was naturally delighted.

**B.W.:** If you receive a drawing that specifies the narrow tolerances associated with milling, and you have the impression that these narrow tolerances aren't necessary, do you then contact the customer to make him aware of this?

**R.R.:** We contact our customers and also invite them to visit us so that we can show them what is possible with waterjet cutting. When discussing the job, I ask whether certain milling tolerances are really necessary or whether the tolerances we can achieve with waterjet cutting wouldn't be suffi-

cient. If I then make a calculation for the customer showing him how much he can save with waterjet cutting, in many cases he is willing to accept this solution. The price is often the decisive argument.

**Th.B.:** This is naturally also heavily dependent upon whether we are talking to the designer or the purchasing department. The purchasing agent has a far less emotional approach. If he sees he can save money, he'll take advantage of the situation. The designers are more likely to raise objections, whereby these are seldom based on the product but rather on the ambitions of the designer.

**B.W.:** Both of the waterjet cutting systems in the Genthner SystemTechnologie factory have been equipped with a shuttle table, which is offered by Bystronic as an optional extra. Why is process automation so important to you?

**R.R.:** Quite simple – thanks to the shuttle table we save at least 30 percent time. Or expressed another way, we can produce 30 percent more. Without a shuttle table and with certain parts it can easily take an hour to unload and then reload the machine. This is unproductive time during which I would have already cut another order. I'd estimate that with 80 percent of the parts we produce, it's worthwhile to use the shuttle table.

**B.W.:** Why is it so important for you to save time?

**R.R.:** Above all because of our short delivery schedules. As a rule we deliver after three working days. Seventy percent of the orders that we produce as a result of the combination of waterjet cutting don't originate from our milling department but from external customers. Of these a significant part consists of prototypes, and these are mostly urgent jobs. This means you receive the materials in the morning and the finished parts are collected in the evening. This demands short throughput times and here the shuttle table helps enormously. I would maintain that in order to achieve the same capacity as our two machines, another company would need four conventional machines without shuttle tables. This is naturally also due to the fact that the ByJet Pro is equipped with four cutting heads.

**B.W.:** Are you satisfied with the four-head version and how do you benefit from it?

**R.R.:** We are very pleased with it. With this version we benefit primarily due to saved time. In the past we had blanket orders that fully loaded our two-head Byjet for as much as two to three days. These long-running series are now handled on the four-head system and can be cut in half the time. From a production lot of around 60 parts and upwards, we have a price advantage of up to 25 percent on the four-head system. A further advantage is offered by the four-head system if we compare it to laser cutting machines. When using tool steel, we are competitive compared with laser cutting from

a material thickness of around twelve millimeters, however, only when we employ all four heads and can operate with production cut standards. With stainless steel this applies already from a thickness of ten millimeters. Naturally, the various laser powers have to be taken into account as well.



*Thomas Bechtold (pictured left) and Ronny Retzlaff of Genthner SystemTechnologie use a combination of milling and waterjet cutting in order to achieve lower prices and shorter delivery times.*

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## Genthner SystemTechnologie

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"Quality not quantity" is the motto of the Genthner SystemTechnologie Company. This medium-sized company, with more than 20 years experience in the field and its registered office in Birkenfeld-Gräfenhausen in the south of Germany, sees itself as a strategic system partner for the industry. It offers a very broad spectrum of services from CAD/CAM programming and parts production right through to the manufacture of subassemblies and equipment, including all the associated tasks such as purchasing, logistics, and final testing, so that the customer can concentrate on his own core competencies. Well-known companies from the fields of medical technology, optical systems, measurement systems, automation, aerospace, and machine as well as plant manufacture take advantage of the range of services offered. In particular manufacturers of medical equipment outsource complete production processes to Genthner SystemTechnologie.

The company guarantees its customers high-quality parts that are ready for assembly, subassemblies, as well as complete devices. As a system provider it possesses a high level of versatility, a state-of-the-art and diversified selection of machines, and an in-depth range of vertical manufacture. Hence it is in a position to offer a truly comprehensive service, from consultancy right through to just-in-time supply, which also includes ESD-protected final assembly and extensive functional testing, commissioning, and documentation. Furthermore, Genthner SystemTechnologie is certified in accordance with DIN EN ISO 9001:2003 and EN 9100:2003 (aerospace approval), amongst others.

[www.genthner-gmbh.de](http://www.genthner-gmbh.de)

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