



WATERJET CUTTING AND NOTHING ELSE

CECON FERTIGUNGSTECHNIK GMBH CONCENTRATES SOLELY ON WATERJET CUTTING AND ON MASTERING THE ENTIRE PROCESSES. HENCE, THE AUSTRIAN COMPANY HAS GAINED A REPUTATION AS A CUTTING SPECIALIST. THE LATEST INVESTMENT WAS IN A BYJET CLASSIC, WHICH WAS LAUNCHED ON THE MARKET JUST A FEW MONTHS AGO.

Text: Volker Albrecht, Photos: Julia Wesely

THE TRUCK IN FRONT OF US is going to the same place as we are. It stops in front of a loading bay door on the Krottendorf industrial estate near Graz, Austria. The name "Cecon" is written above the door; from inside the building one can hear a hissing sound; the hall is shrouded in a veil of mist. It is here that the first waterjet cutting system of the new ByJet Classic 3015 will be installed.

In the first-floor office, the two founders of the company, Johann Feichter and his wife Helga Feichter-Leitinger, are waiting for us. In his main profession, Johann is a partner in a tax consultancy and accountancy company. In his secondary occupation, he is a user of waterjet cutting technology, and he holds the honorary office of mayor of the municipality of Krottendorf-Gaisfeld with its 2,300 inhabitants. His wife is co-owner as well as the manager of a bookkeeping office, and is an authorized signatory in their shared company, Cecon Fertigungstechnik GmbH. They are both entrepreneurs by passion: "Someone who spends every day telling other people how to run their business can also run his own," comments Johann Feichter. This appears to be the case, because since it was founded five years ago, the company has made a name for itself as a specialist for precise waterjet cutting. Actually, everything started in a rather extraordinary way. Aiming to set up provisions for their retirement, the "young entrepreneurs" built a factory hall with an integrated office on the industrial estate. The idea for a suitable business came to Johann Feichter from a childhood memory: "At the time when the first rocket flew to the moon, I was impressed to learn that its insulating material had been cut using a jet of water." The idea was born; authoritative figures for the business plan were gathered in three months of intensive research on the Internet. This showed that modern waterjet cutting was a flexible, highly precise pro-

cess for shaping virtually all materials, that it was a growing market in view of many new materials, and that waterjet cutting facilities were few and far between in Austria.

EQUIPMENT AND KNOW-HOW

Precision and reliability were decisive criteria in choosing which particular machine to buy. And since Bystronic is a global supplier, Johann Feichter had a greater feeling of trust in the Swiss company than in other suppliers. The Byjet 4022 was delivered at the end of 2004; production started at the beginning of 2005. Johann Feichter consciously decided on a machine with a large cutting area: on the Byjet 4022, sheets of raw material of up to 4,000 by 2,250 millimeters can be processed using two cutting heads. And since, as newcomers, they wanted to be outfitted as broadly as possible in order to be prepared for all enquiries, the system was additionally equipped with a rotary axis for processing tubes and profiles, as well as a CNC-controlled drill spindle. The latter is a useful addition particularly with fiber composite and laminated materials, where it can be used to avoid delaminating, i.e., the separation of the individual layers, during piercing.

According to Johann Feichter, in spite of the top-class equipment, the beginning was very hard and the staying power of the company founders was limited to 70,000 euros. "At minus 55,000 euros, we received a fantastic order: cutting titanium. That was the moment when we realized: 'Hey, we've been discovered.'" Subsequently, Cecon grew steadily. Today, the business has a well-developed customer base and an established name. New customers are acquired through word-of-mouth advertising. The company is known as a specialist for waterjet cutting. The original plan to offer other forms of cutting at a later date has been dropped, "because the demand for our current services is very satisfying," as Johann Feichter explains. Furthermore, the know-how gained over the years is an asset that should be fully exploited, since waterjet cutting is more complex than other cutting processes, not least because of the wide range of materials. Every material behaves slightly differently under the waterjet, and hence the corre-



Cecon: the job shop for precise waterjet cutting.

The Austrian company Cecon concentrates fully on waterjet cutting.



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sponding practical experience must first be acquired over a period of time. "It's not always a simple process, but a very interesting one," acknowledges Johann Feichter.

ALMOST UNLIMITED POSSIBILITIES

Johann Feichter is always surprised to find that the possibilities and the limits of waterjet cutting are still little known, even amongst experienced factory foremen. Hence, he still receives inquiries for parts that are typically produced by laser cutting, where the hardening of the outer surface presents no problem and which could be cut far more economically using a laser. "Waterjet cutting is, however, absolutely ideal when thermal neutrality is called for," he explains. On the other hand, many factories are not aware that they can save a great deal of time and money by using waterjet cutting to replace or to complement mechanical cutting processes such as milling. The situation is similar with expensive wire eroding, which is often used even though the level of precision that this method

offers is really not required. In this area, the future will certainly see a number of changes, Feichter believes.

Waterjet cutting is a cold, erosive cutting process using a compressed jet of water at 3800 bars. Depending on the hardness of the material to be cut, cutting involves a pure jet of water, for example with foam rubber or plastics, or a mixture of abrasive material and water. The jet with a thickness of 0.8 to 1 millimeter hits the surface of the workpiece at around 300 meters per second. Nevertheless, the reactive forces in the workpiece are so small that in many cases, it is unnecessary to clamp the workpiece. Accordingly, the edges remain undistorted and thermally unaffected.

In principle, the Byjet can be used to cut all types of material economically and accurately, and this message is spreading in the area around Krottendorf. Hence, the current jobs, pattern parts, and skeletons from completed orders that can be found in the factory and around the machine cover a broad spectrum of what is possible. They in-

clude parts of thick and high-tensile steel for the machine industry, stainless steel, aluminum, and copper parts, parts of hard lightweight construction materials such as titanium alloy, foam rubber sheets, and natural rubber parts, which are cut at up to 25 layers one on top of the other. Other processed parts are cut from foam and insulation materials, cardboard, carbon fiber reinforced plastic, composite materials, and stone. Especially with soft materials, which are pressed together by the clamps with cropping or punching, the force-free cutting power of the waterjet increases the cutting accuracy. For very hard and brittle materials such as carbon fiber reinforced plastic, glass, or plastic, which can easily break off on the cutting edge, waterjet cutting is often the only option.

All the various tasks that are associated with cutting – from the initial programming, the calculation of the cutting time, and the cost calculation to the preparation of the offer and the management

of the orders – are carried out in the office next to the production hall by two Cecon employees. "The BySoft software is the big hit," says Franz Hiden when asked about the Bystronic CAD/CAM program package. It is simple and intuitive and easy to grasp even for a nonexpert. And he should know, since he is a trained carpenter who encountered waterjet cutting for the first time at Cecon.

Three years later, he knows the machine like no one else in the company. His skill is due to the intensive and excellent training at Bystronic in Niederösterreich, Switzerland, and the systematic mastering of the handling of new materials and cutting tasks. With complex orders that other job shops were forced to refuse, a part of the task is to work out the solution using trial cuts and to involve the customer in this process. "In some 90 percent of the cases, we find a solution," says Johann Feichter. And these special orders often turn into series production orders and long-term business relation-



ByJet Classic 3015 – a Waterproof Investment

In the summer of 2009, Bystronic launched its latest innovation for waterjet cutting with the new ByJet Classic 3015. The machine is of particular interest to users who demand a high-quality system coupled with precise cutting results, but for whom a clearly manageable investment volume is important at the same time.

Thus, the ByJet Classic 3015 is a convincing buy thanks to high earnings and a minimal purchase price. This means that a quick return on investment is assured even with reduced capacity utilization. Thanks to the combination of proven components and innovative technology, the system offers a high level of functionality. This ensures that, particularly for standard applications, the user is optimally equipped, even in multishift operation. At the same time, the ByJet Classic 3015 has a long service life and maintains lasting precision. These are guaranteed by the high-quality machine construction, perfect matching of the individual components, and mastery of the entire process.



ships. However, what is good for the reputation and can later generate a profit can also block orders that are today already financially lucrative. Thus, trial cutting must often be carried out in the evenings or on Saturdays.

WITH THE SECOND MACHINE, THINGS WILL BE EASIER

For this reason alone, the thought of buying a second system has been under consideration for some time. "An additional system that allows us to carry out trial jobs or the cutting of individual parts in parallel to existing orders simply makes us more flexible," says Helga Feichter-Leitinger, who is responsible for the commercial aspects at Cecon. This is especially true since job orders with tight delivery schedules are steadily on the increase. A two-day period between receipt of the order and the delivery deadline is by no means rare. And such deadlines were becoming increasingly difficult to maintain with just a single machine. Furthermore, a second Byjet would allow Cecon to make even better use of the capacity of its employees, since, according to Johann Feichter, waterjet cutting is a stable process – in particular when a Byjet is being used.

Between the willingness to invest and the purchase decision, however, the current economic situation had to be taken into consideration. Competitors with cheap machines were generating pressure in the market because they were also able to offer low prices. However, the customer cannot ascertain the precision of the parts they produce simply from comparing suppliers' Web sites. In this situation, the new Byjet Classic 3015 was a "dream come true" for Cecon, since it was competitively priced while offering virtually the same functionality for standard orders.

"With the ByJet Classic, we can absorb the current pressure on the margins and nevertheless offer the precision our customers have come to expect. This was really the decisive point for us," says Johann Feichter. Furthermore, as a result of the favorable price and the wide range of applications, the machine can be quickly amortized.

The ByJet Classic 3015 uses the same components as the Byjet 4022. The two cutting heads are the same, the high-pressure pump is the same, and the control package is essentially the same, but newer and faster than the previous model. Only the frame is somewhat different, since the bridge with the two cutting heads is arranged at right angles to the basin and the working table can accommodate raw material sheets of up to 3,000 by 1,500 millimeters. It is not equipped with a rotary axis or a drill spindle. But at Cecon, these are already available on the Byjet 4022, and thus the

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Johann Feichter, Cecon co-owner

orders in question are processed on this machine. The Byjet Classic 3015 offers all the important functions, all the existing programs can be used, and operation is identical right across the board. As far as Johann Feichter is concerned, it is thus an ideal, fully fledged addition, not simply a trimmed-down emergency solution. Thanks to this machine, he believes Cecon has further improved its competitive position. He has difficulty hiding his pleasant anticipation of the new machine, which will be installed in just a few weeks.

Donning a new hat, the Mayor Johann Feichter has to leave to deal with official public business. The truck has been unloaded in the meantime; two palettes, each carrying a 15-millimeter-thick steel sheet, have been placed in front of the waterjet cutting system. Indications of hopeless attempts to cut out flanges from the sheet using a laser cutting machine are clearly visible. The kerfs are melted, and where the parts can be pried loose, the cut edges resemble a crater landscape. Most likely a flameproof material, says Franz Hiden. It is one of those problem jobs that arrive at short notice. Half an hour later, the first two waterjet-cut flanges lie on the frame of the machine. Clean, smooth, and with straight edges; cut to an accuracy of 0.2 millimeters. Franz Hiden restarts the machine; it will be in continuous use for a period of 14 hours. It is Friday afternoon. Franz Hiden will check later in the evening and during the night whether the machine is still running by using a PC and a camera. If something is not right, he will drive to the factory, eliminate the problem, and let the machine complete the order. The cut parts are needed and will be collected on Saturday morning.

Volker Albrecht, Dipl.-Ing., is a journalist who lives in Bamberg, Germany, and has many years of experience as editor-in-chief and publications manager with production-oriented trade magazines.

Founders and owners of the Cecon Fertigungstechnik GmbH: Johann Feichter and Helga Feichter-Leitinger.