



## THE UNIVERSAL CUTTERS

THE KEMA METALWORKING SHOP HAS EARNED AN EXCELLENT REPUTATION THROUGH VERSATILITY AND FLEXIBILITY. AND NOW THE BUSINESS IS BEING EXPANDED TO INCLUDE WATERJET CUTTING! FOR THE FITTERS, NO PROBLEM PART IS SO EXOTIC THAT IT IS NOT WORTH ATTEMPTING A TRIAL CUT ON THE BYJET PRO L 6030. MOSTLY WITH SUCCESS.

Text: Volker Albrecht, Photos: Stephan Dürer



Left: Dieter May and Klaus-Peter Kersch with their ByJet Pro L 6030. Below: Raw material waiting to be processed in the Kema factory yard at Trierweiler.



carefully conceived and executed in order to save space: The pump and other elements were installed on a three-meter-high steel platform, the abrasive sand is stashed in a several stories high hopper, and there are no big bags in sight. Even the tank for the used water-sand mixture that has to be disposed of is half hidden under the steel platform. In December 2009, Dieter May and Klaus-Peter Kersch entered the world of waterjet cutting with their 35-person company – as a second business segment. Metal structures for the building industry, balconies, handrails, and stair constructions in steel and stainless steel are their actual métier: “The word ‘Schlosserei’ (fitter’s shop) in the company’s name says it all,” says Dieter May, who set up the company together with Klaus-Peter Kersch in two garages more than ten years ago. The noise confirms this: In the workshop, the deafening sounds cause one’s eardrums to vibrate; banging, hammering, welding – welding fumes hang in the air; the smell of fresh paint is overpowering. The order currently being processed is for cycle shelters for the city center of nearby Luxemburg.

The internal fittings of the stage tower of the Luxemburg Metropolitan Theater also originated in the workshop in Trierweiler. And Kema has also taken over the maintenance contract for the fire doors of the new Philharmonic in the grand duchy. Additionally, there are installations and customized systems for industry. Kema’s preferred material is stainless steel. Nevertheless, an example of a 20-millimeter-thick glass oval engraved with a company logo sits on a samples table next to the ByJet Pro L. It is a special Christmas gift for the key

*“Many customers not only place fitter’s shop orders, but also cutting orders.”*

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Managing Director,  
Kema Schlosserei GmbH

**UNDERNEATH THE WATERJET**, a part that will finally become a bioethanol stove revolves. The 1.5-meter-long 323 steel pipe with a wall thickness of eight millimeters is being cut on the rotary axis of a ByJet Pro L 6030 waterjet cutting system. The machine stands in the Schlosserei Kema metal-working shop in Trierweiler, Germany, where it will cut holes in another 400 such pipes this year. The material for this is already held in stock.

Ceiling-high racks separate the system from the rest of the workshop. With its six by three meter cutting area, the installation of the ByJet Pro L was



*The optional rotary axis allows processing of round and profile tubes. Handling of the ByJet Pro L is extremely user-friendly.*



customer, the Dr. Oetker frozen pizza factory in Wittlich. "Not an easy task," as Dieter May explains in passing, since when glass is engraved on the surface, it releases tensions that can easily make it shatter."

### THE DEMAND FOR CUT PARTS IN A RANGE OF MATERIALS IS GROWING

Dieter May became aware that many customers not only had fitter's shop orders to place, but also cutting orders, and not only in stainless steel, but also in plastics such as S<sup>®</sup> (ultrahigh molecular polyethylene). When the time came to replace the obsolete plasma machine, it made sense to expand the business with a waterjet cutting system offering high flexibility in terms of the type and thickness of material. Following an intensive period of assessment, about a year ago, the Expert version of the ByJet Pro L was selected. It has four cutting heads that can be individually controlled and whose separation distance can be automatically adjusted. Compared with a single-head system, orders can be processed up to four times faster. And with the PrecisionAligner, which was presented by Bystronic at the EuroBLECH 2010 exhibition for the first time but is not yet used at Kema, multiple-head cutting is also possible within a single part. The resulting productivity makes all notions of requiring an even higher cutting pressure redundant. Dieter May is convinced that he would not cut one jot faster with 6,000 bars than with the ByJet Pro L with 3,600 bars. Furthermore, he would then have to reckon with considerably higher wear and tear and exorbitant costs.

The cutting area of six by three meters has two advantages for Kema: firstly, extra-long parts can be cut, and secondly, thanks to the option of subdividing the working area, the machine can be used like a shuttle table system. This means that one area of the cutting table can be loaded and unloaded while the machine cuts in the other area. To ensure that the loading and unloading can take place conveniently and that it takes no longer than the cutting process even with short-cutting-time orders, the ByJet Pro L is equipped with exchangeable cassettes that can easily be lifted using a lifting beam. The managers at Kema treated themselves to a further extra, the rotary axis integrated in the machine. With the aid of this rotary axis, round and profile tubes with a diameter of up to 500 millimeters and a length of up to 5,700 millimeters can be processed.

Immediately following the installation of the ByJet Pro L, the investment was assessed in detail; after all, the ambition to take full advantage of the possibilities offered by the new high-tech weapon was high. "We learned how to handle the machine and waterjet cutting in a compressed form." The two most capable employees were trained to become machine operators. The programming know-how was acquired by Dieter May and his workshop manager. "We collected and cut leftover pieces of granite, glass, POM and S<sup>®</sup> Green, steel,



*Despite the expansion of business to include waterjet cutting, the fitter's shop remains the core business of Kema.*

and stainless steel. Without having received any orders. When the first orders came in after eight weeks, we had mastered the machine." Half a year later, the programmers and operators have internalized the way to change the parameters in order to optimize the cut quality with new materials. This saves valuable time, since the machine capacity is well used. For Dieter May, it is precisely the problem parts that are most interesting, not only because they are technically appealing, but also because with parts that could only be cut with great difficulty using traditional processes, there is seldom any haggling over the price.

"Our principal business is with stainless steel in the 30-millimeter range, sometimes also up to 45 or 50 millimeters," says Dieter May. With construction steel, even greater thicknesses have been cut. And additionally, of course, there is an enormously broad spectrum of other materials. When he travels to visit customers, he takes a wide range of samples with him. "It is astounding just how many people involved in mechanical processing don't know what quality of cut is achieved with waterjet cutting. A quality of finish for which no allowances have to be planned in. We deliver the part in a finished state; at the most, a thread may still have to be cut. But one seldom receives an order without a visit, without consultation." It is here that the effort he has invested in creating samples from various materials, of various thicknesses, and with various cutting qualities really pays off. The spectrum ranges from Pertinax, which clogs up milling machines, foam rubber that is cut as a sandwich between wooden sheets because it would other-



*Top: Cleaning the ByJet Pro L.  
Center: Operation of the machine is simple and highly intuitive. Bottom: The exchangeable cassettes, together with lifting equipment, allow easy unloading of parts.*

wise be blown away, through to polyamide plastic, PVC, POM and S® Green, and on to DIN 1626 (St42) steel and aluminum. "We have even cut 3.5-millimeter holes in 20-millimeter V4A stainless steel. It's possible," says Dieter May

### VERSATILITY AND FLEXIBILITY ARE IN DEMAND

Only a year after the ByJet Pro L was put into service at Kema, Dieter May can already reel off one cutting story after another. He talks about a glazier who came to him with ninety glass parts that were two centimeters too wide because the customer had measured incorrectly. On the glass-cutting machine, the glass shattered during the trimming; with the ByJet Pro L it was no problem. Or the story about the granite mason for whom he was able to cut small holes because the mason did not have the corresponding diamond for this type of granite. Today, this granite mason brings him the craziest things to process. He has even cut crystalized quartz into thin slices for him: "That was a pioneering feat."

Waterjet cutting also offers advantages in Kema's core business. "It's a refinement of our work. For example, a traditional metalworking shop buys standard die cast glass clips in order to secure glass balustrades. But architects don't want off-the-shelf articles and design their own clips of stainless steel. These are then cut by us precisely according to specification – and the rubber washers at the same time." With such services one can soon make a name for oneself in the building industry, just as with the processing of weathering (Corten) steel, which according to Dieter May has become an essential part of every building in the historic city center of Luxemburg. If this steel, which when oxidized develops a decorative surface, is cut on a plasma machine or a laser cutting machine, the cut edges no longer rust as quickly. This is not an issue with heat-free waterjet cutting.

And with that, Dieter May returns to the housings for the bioethanol stoves. These, too, were once problem parts for the retailer in Trier who assembles the stoves for a Swiss stove maker. He was unable to find anyone within a radius of 300 kilometers who was able to cut the parts cleanly. Instead, the frayed edges produced by laser cutting were welded, polished, and varnished. "We had to construct special mountings for the rotary axis, but it's possible without additional finishing," and in fact far better than the customer had expected. The same customer has in the meantime requested sample cuts of cylinders made of heat-resistant glass, and will almost certainly place an order for this work.

In spite of, or perhaps because of, the good business trend, Dieter May now has a problem. "The machine is operating almost at full capacity." This means that the ByJet Pro L is in service between 14 and 17 hours a day at the moment. From seven in the morning until five in the afternoon, one of the two operators monitors the system. "After five o'clock we set up the machine with long-running



*Reliable and powerful: The high-pressure pump enables extremely precise cutting.*

orders that are programmed in sequence and are processed unmanned throughout the night." Dieter May is delighted that he deliberately chose reliable engineering, which in future will be supported by a text message (SMS) notification system for the operator and a webcam.

Today, Kema has adjusted its organization to the new basic conditions: The reduction of throughput time from one to three months in the metalworking shop to three to five days with waterjet cutting has raised a number of issues as far as material handling is concerned. In the meantime, an automated warehouse is under construction for steel and stainless steel, and as far as the more exotic materials are concerned, it is up to the customer to deliver the materials and pick up the leftovers after the job has been completed.

The ByJet Pro L now operates at almost full capacity, performing commissioned work on approximately a two-shift basis. Hence, the decision to purchase an additional Bystronic waterjet cutting system has already been made internally in order to regain the flexibility to make samples and test cuts. For in the final analysis, flexibility is the basis of Kema's success. "Mixed products, mixed customers: That's the strategy. We want to maintain our flexibility," summarizes Dieter May. Proof of this approach can be seen in one of his latest projects, which you would not normally expect to find in a metalworking shop: "Very soon we will be cutting pizza cheese on our system. On a test basis. This cheese is used by the ton for frozen pizzas and always causes problems with the knives." Naturally, the cheese will be disposed of after the tests. Whether or not this will lead to a long-term cutting order on a specially purchased pure-water waterjet system is still written in the stars. But in the meantime, it is clear in which machine manufacturer Dieter May would place his trust.

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**Dieter May,**  
Managing Director,  
Kema Schlosserei GmbH

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