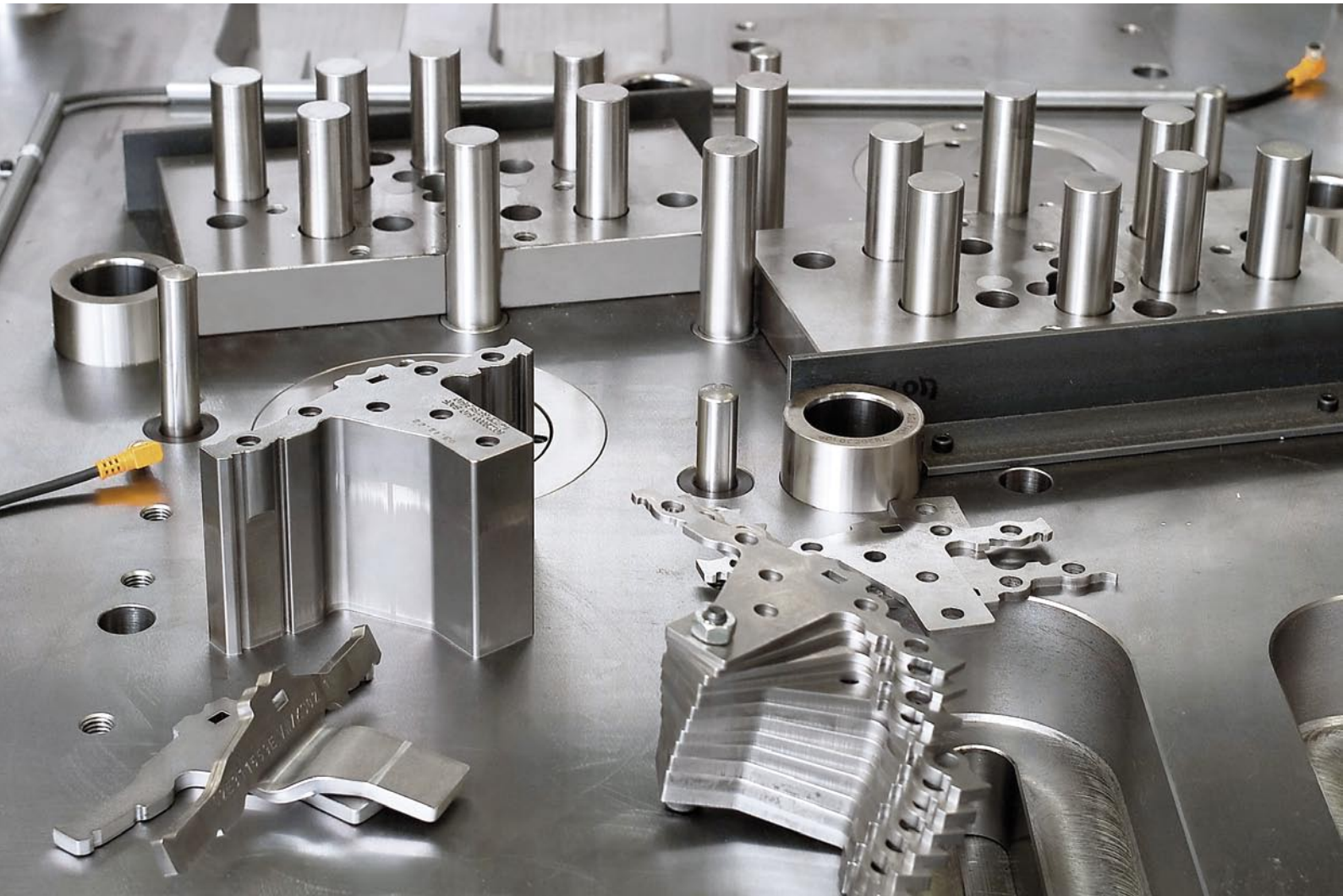


THE WISE PRODUCE MORE ECONOMICALLY

THE SWISS FEINTOOL GROUP IS WELL KNOWN AS A WORLD-MARKET LEADER FOR PRODUCTS AND SERVICES IN THE FINEBLANKING SECTOR. THE COMPANY HAS PERFECTED THIS PROCESS – IN EXACTLY THE SAME WAY AS THEIR INTERNAL PRODUCTION PROCESSES. HERE A BYJET WATERJET CUTTING SYSTEM IS IN USE, WITH WHICH FEINTOOL HAS BEEN ABLE TO SIGNIFICANTLY LOWER CERTAIN PRODUCTION COSTS.

Text: Martin Engel, Photos: Marc Kollmuss



AND IN THE BEGINNING there was a simple question: "Do we want to continue to throw money out of the window?" Hanspeter Suter, a perfectionist, therefore sought ways in which costs could be reduced when cutting precision parts. Technologically he quickly came up with waterjet cutting, and at Feintool it also did not take long to find the necessary applications to ensure use of the full capacity of the machine. Since investing in a Bystronic Byjet, the company uses the system to cut parts that must not be thermally affected, that are up to 80 millimeters thick, and which are very often constructed of hardened materials which must nevertheless be precisely processed.

Hanspeter Suter is Head of Tool Making at Feintool Technologie AG in the Swiss town of Lyss. Feintool is not only the technology leader, but is also by a large margin the global number one for the sale of the corresponding fineblanking presses and tools. The company not only offers the complete bandwidth of services and solutions in connection with fineblanking, but also comprehensive consultancy, as well as mass production of fineblanking parts. "And if a customer wants a complete, fully automated production system and at the same time a new factory, he can purchase everything from us," adds Hanspeter Suter. In short: Feintool is the only supplier that can satisfy every customer requirement associated with this technology.

To be able to offer this, the company maintains a global sales network as well as technology centers in the USA, in Japan, and at the headquarters in Switzerland – where among other things tools are manufactured. Since, as with conventional punch presses, the tool that is used to punch the parts from the sheet metal is the heart of a fineblanking press. However, while with punch presses the force is transferred to the metal sheet in a relatively simple manner in that the punching tool is forced into the die and the part is half cut and half broken out of the metal sheet, with fineblanking the distribution of the force is far more delicate. During the cutting process three forces affect the metal sheet. Additionally, the clearance between the die and the punching tool is minimal. The result: parts are truly cut and not broken out of the sheet. The cutting edges so formed are smooth, free of tears and chips, and are at right angles, thus the part can be used for its intended function, for example in a vehicle gearbox, without follow-up machining. However, the tools are not only used for cutting parts, but if



"What we do here is often in the same category as producing gauges."

Hanspeter Suter, Head of Tool Making

necessary also for forming them, "since a procedure is all the more lucrative the greater the number of other procedures it can replace," explains Suter. But even though the quality of the parts handled in this way is extremely good, the process is subject to nature's laws of physics and hence inevitably to wear and tear. "Depending on the type of material, the tool has to be removed from the machine after

The tools of the Feintool presses are used to produce the very-highest-quality parts.



IFS
In-Service-System

FEINTOOL
HFA 3200plus

FEINTOOL

SOCKET

20,000 to 200,000 presses and reworked," says Suter. Shims compensate for the difference in height. They are temporarily fitted between the cutting die or the cutting plate and the tool block and are produced in varying thicknesses, between 3 and 6 millimeters, and bundled in sets.

SAVE MONEY WITH BYJET

"Our tools are later used to produce parts that must meet the highest demands of the end user," is how Hanspeter Suter defines the challenge. The largest sector in which the fineblanking parts are used is the automotive industry, which also demands the necessary number of items to permit Feintool customers to run a fineblanking press at a profit. And it is precisely these end-user demands that have continuously increased during recent years. "That today the corresponding parts have to be cut to an accuracy of 1 or 2 hundredths of a millimeter is quite normal." For the manufacture of the active parts of a tool, namely the die and the punching tool, this means that tolerances in the micrometer range have to be adhered to. Hence the machines in his area are of the highest quality. "What we do here is often in the same category as producing gauges," says Suter.

The existing production facilities were initially used in part for the shims mentioned above. Raw material sheets were welded together in packs of ten and subsequently cut using wire electric discharge machining (wire EDM). Finally the shims were ordered from an external job shop. The catch: the costs were disproportionately higher, and as the demand for these shims increased so did the price. Something had to be done. And hence Hanspeter Suter was faced with the question of determining what was the most suitable method of producing the shims in-house at a low price. "A questions that as far as I was concerned was quickly answered with waterjet cutting," recalls Suter.

Why? The first point mentioned was precision. Bystronic waterjet cutting systems generally work within a tolerance of plus/minus one tenth of a millimeter – naturally depending on the quality and thickness of the material. These values, according to Hanspeter Suter, are perfectly adequate for the manufacture of shims. In this case there is no justification at all for the extreme precision that can be achieved with wire EDM. He mentions that the raw material sheets consist of already hardened material, which however poses no problem for the waterjet cutting system, since one of its main advantages is the almost boundless flexibility which

"Through the use of waterjet cutting, we save almost a third of the manufacturing costs for shims."

Hanspeter Suter

makes it possible to cut almost any material imaginable. For the reason already mentioned, he wanted to avoid the subsequent hardening of the parts no matter what, since every additional process step makes the manufacture of a part more expensive. A further argument in favor of waterjet cutting is the fact that the cut edge is not subjected to any thermal loading. "A criteria," according to Suter, "which it is compulsory to fulfill." And last but not least: the lower production costs. "Through the use of waterjet cutting, we save almost a third of the manufacturing costs for shims," explains Suter.

VERSATILE

Except that the investment in a waterjet cutting system could never be justified for the manufacture of shims alone. "The amortization time would have been far too long," points out Hanspeter Suter, who subsequently investigated further application possibilities. He initially came up with the manufacture of prototype parts. He explains: "Let us assume that a car manufacturer wants to launch a new model and orders gearbox parts in small numbers from our customer to build the prototype. It makes no sense in this phase to manufacture a fineblanking tool, the production of which can take up to 25 weeks and is correspondingly expensive." Instead, Feintool offers to take over the manufacture of such parts for the customer. Earlier these were produced in a series of working steps using the available production methods. Today the waterjet cutting system is used for the preparation of the metal sheet. In this way the cost of the part can easily be halved, says Suter. Overall a handsome sum can be saved. But that is not all. A further field of application for the waterjet cutting system resulted from the production of ring stamps. Because of the extreme tolerances demanded, these cannot be completely manufactured using the waterjet technology, but at least the preparation work can be done, which also permits significant cost savings to be made. Since instead of turning the inner shape, thus creating chippings as scrap, it is today cut out. The blank for the ring stamp is subsequently machined further. The material cut out is returned to stock for later use. A demonstration object clearly shows the



The Byjet cuts parts accurately within a tolerance of plus/minus one tenth of a millimeter.

The Swiss Feintool Group is world-market leader for products and services in the fineblanking sector.



immense material and cost savings that can be achieved using this procedure. In this concrete example, the weight of the inner contour is 16 kilograms. The purchase price of the material is 50 Swiss francs (just under 35 euros) per kilogram. This means that 800 Swiss francs have been saved from becoming scrap.

The acquisition of a Bystronic Byjet waterjet cutting system in 2007 already paid dividends for the company even after a very short time. Alone for material costs the annual saving amounts to 110,000 Swiss francs (around 75,000 euros). Also a price comparison with electric discharge machining (wire EDM) falls clearly in favor of waterjet cutting, with part costs that are some 80 percent below those for wire EDM, as the experience gained by Feintool with the manufacture of the shims has shown. Although the hourly rate for the Byjet of 130 Swiss francs (around 90 euros) is more than double that of the wire EDM system, the processing of an order with the latter takes very much longer. Thanks to the dual cutting heads, two elements can be cut every two and a half minutes. With wire EDM, however, it takes seven hours for ten elements – but only as long as the unprocessed material was welded together to form a ten-sheet pack.

With the applications described above, the Byjet at Feintool is used to capacity on five days a week during one and a half shifts. And a further application is already in the evaluation phase. This foresees that what is known as pressure plates will also be manufactured on the Byjet in the future. These plates are used with the fineblanking machine for transferring the force. In principle, according to Suter, their production on the waterjet cutting system presents no problems, but is only worthwhile if the subsequent processes can be saved, in this case particularly the hardening process. He has been looking to purchase 58 HRC steel in a thickness of between 30 and 40 millimeters, but to date without success. That the pressure plates will at some stage also be cut on the Byjet is, however, a foregone conclusion for Suter. "Once we have set our minds on something for our customers, we will always find a solution, guaranteed," he states.

There remains just one more question to answer, why Feintool chose Bystronic as their partner for waterjet cutting. "Waterjet cutting systems are subjected to enormous loads and potentially also high wear and tear. Thus we definitely wanted to purchase a high-quality system," explains Suter. On this

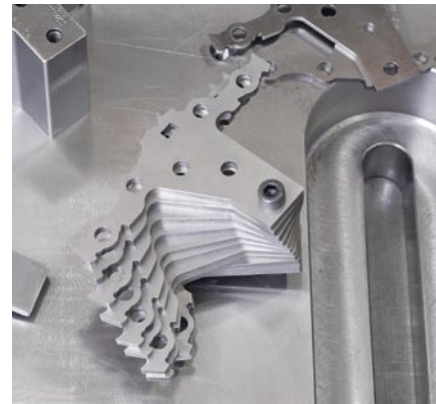
Feintool

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| Business areas: | <ul style="list-style-type: none"> • Supplier of presses, tools, and peripheral systems as well as a competent service partner (Fineblanking Technology Segment) • Manufacturer of economically priced mass-produced parts using the fineblanking technology (System Parts Segment) • Automation solutions ranging from material conveyance through to fully automatic assembly lines (Automation Segment) |
| Headquarters: | Lyss, Switzerland |
| Founded in: | 1959 |
| Turnover*: | CHF 370 million |
| No. of employees*: | 1,528 |

www.feintool.com

*Financial year 2008/2009. Figures as per September 30, 2009.

basis they examined the market closely. In the final phase two suppliers were shortlisted, whose systems were on a par both technically and with regard to price. According to Suter, they then checked on the opinions of other users and came to the conclusion that Bystronic offered the better service. "A system that remains idle because the service of the machine manufacturer is not available locally is an expensive system." And one thing we have learned is that unnecessary costs are given a hard time at Feintool.



Major savings: compared with wire EDM, shims can be produced some 80 percent cheaper using the Byjet.

The preparation of ring stamps (top right) and prototype parts (bottom right). The quality is right – also thanks to the Byjet.