

FEHLMANN

# report report



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ans  
years

Precision machine tools – innovative, process-oriented, future-oriented

## Represented throughout Switzerland and internationally

**Trade fairs are not only a good platform for us to present our products. We also value the professional exchange and dialogue with our customers that occurs at these events.**

During the last two years, a motivated FEHLMANN team has been presenting the innovations surrounding precise milling, grinding and drilling at various international trade fairs. For example, in 2018 at the CCMT in Shanghai, where CEO Frank Fehlmann welcomed the Swiss ambassador, Jean-Jacques de Dardel, at our exhibition booth.

At the EMO Hannover, the world's leading trade fair for metalworking, the VERSA 645 linear with new «milling & grinding» technology was presented to a broad trade-specialist audience for the first time. And for the last time in Basel, FEHLMANN showcased its services on home soil at PRODEX, the meeting point of the Swiss MEM industry. The new INNOTEQ industrial trade fair will replace what was previously PRODEX. As of 2021, this new trade fair will take place in Bern and we will also be prominently represented there.



*Frank Fehlmann welcomes the Swiss ambassador, Jean-Jacques de Dardel, to the FEHLMANN booth at the CCMT 2018 in Shanghai.*



*Swissness at the FEHLMANN exhibition booth at the CCMT 2018 in Shanghai.*



*Presentation of the milling-grinding center at the EMO 2019.*



*A knowledgeable trade fair team provides customers with expert professional advice that is geared to their needs.*

## Trade fair and event calendar

Many planned events had to be canceled this year. So now we are looking forward all the more to the major highlight for this year: the FEHLMANN 90th anniversary in-house exhibition from 28–31 October, 2020. In addition to many exciting topics, such as the technology behind «jig grinding on a milling center», we are particularly pleased to present the extended VERSA series to you. And you can be there too!

**Upcoming trade fair and event dates can be found on [www.fehlmann.com](http://www.fehlmann.com)**



*Simply scan the code with your smartphone camera.*



*A concentrated charge of precision machine tools at PRODEX 2019 in Basel.*

**Dear Readers,**

When the «W. Fehlmann Mech. Werkstatt und Apparatbau» company was founded in 1930, Wilhelm Fehlmann's business idea was to carry out contract orders for the growing domestic textile industry and the regional electrical engineering and machinery industry. However, the world economic crisis of the 1930's threw a spanner in the works and this accelerated the development of an in-house machine line-up. In 1954, Willi Fehlmann took over management of the company and led it into another re-orientation, namely towards the then-emerging international precision industry.

Fehlmann AG has experienced ups and downs in the past 90 years. For us, seeing our customers successfully advancing their business activities using FEHLMANN machines drives us and makes us proud on a daily basis. FEHLMANN machines are used in many mechanical engineering and tool-making industries, even where one would not expect to see them at first glance: in the food industry, manufacturing machines for filling coffee capsules, or making injection molds for the production of PET bottle blanks, to name but two examples. In the branded goods industry, for example, for the manufacturing of pocket knife components; in the watchmaking industry for the production of special tools for fixing watch components during production. Or in medical technology for the automated production of bone plates, bone fixation devices for minimally invasive surgery or knee joint components. For contract manufacturers in the automotive, aircraft and electronics industries, e.g. for the production of microchip manufacturing machines, plastic injection molds, turbine blades, etc. And of course in dual apprenticeship training. Seen in this light, you, dear readers, come into contact with FEHLMANN every day and in almost every situation in life!

In spite of these diverse application possibilities of our premium «Made in Switzerland» products, FEHLMANN has not been unaffected by economic fluctuations. Our independence and long-term business strategy has allowed us to overcome these challenges time and again and draw strength for future economic upturns.

Our 90 years of steady success and the continuous growth built on our own resources would not be possible without our highly-trained and motivated employees. I would like to express my sincere and heartfelt thanks to them.

A very special thank you, of course, goes to our customers and business partners for their trust and loyalty over the many years. I hope you enjoy reading our anniversary brochure.

Kind regards



Frank Fehlmann, CEO and Chairman of the Board



## A reason to celebrate

90th anniversary of Fehlmann AG – a reason to celebrate and say thank you. Thanks to our customers, employees and partners. You can read more about our anniversary in-house exhibition in this anniversary issue on page 9.



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### IMPRINT

**Publisher:** Fehlmann AG Maschinenfabrik  
Birren 1, 5703 Seon/Switzerland

**Circulation:** 5000 copies

**Edition:** September 2020

**Contact:** mail@fehlmann.com, Phone +41 62 769 11 11

## In the spotlight

90th anniversary of Fehlmann AG Maschinenfabrik



## The machine manufacturers from the Swiss Seetal



*The founding Fehlmann family.*

### From drilling machines to automated high-performance 5-axis machining centers

#### Established 1930

The founding of W. Fehlmann AG dates back to the year 1930. Contract work, repairs and prototypes were carried out in the newly-built mechanical workshop in Seengen. However, founder, Wilhelm Fehlmann, soon began developing his own products for the machine industry and equipment manufacturing, such as a drilling machine or a metal hack sawing machine, and quickly gained success.

#### The FEHLMANN concept combines precision drilling and milling in one machine

After the founder's death in 1952, his son, Willi Fehlmann, assumed company operations. During his mechanical engineering studies and a difficult economic period, he designed the FEHLMANN drilling and milling machine that is now legendary. The machine's design had a number of features that were novel for their day, such as a precision coordinate table and infinitely adjustable speed re-

gulation via a V-belt variator, among others. These features all vastly simplified the manufacturing of precise drilling and milling components for precision mechanics and allowed work to be carried out much more efficiently.

#### New buildings in Seon: more space for efficient manufacturing

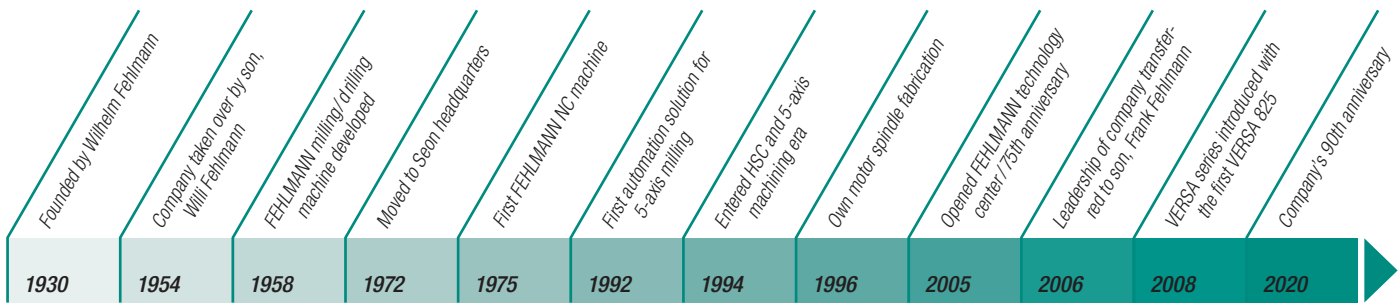
Thanks to a practical machine concept, continuous further development and product-line expansion, FEHLMANN machines enjoyed success both domestically and internationally. The newly constructed buildings, located at the current headquarters «in Birren», Seon, were ready for moving in at exactly the right time in 1972. Shortly thereafter, in 1975, the era of CNC technology commenced at FEHLMANN. A new department for CNC development and construction of electrical equipment was added. Production of machine parts was also continually expanded and updated. All of these elements were easily integrated into the new factory.

#### High-tech milling applications change the face of milling and drilling machines

The challenges of the 90's: high-speed cutting (HSC), 5-axis milling, automated solutions for individual parts and small quantities. Together with customers in mold and tool production, as well as in parts manufacturing, Fehlmann AG brought the perfect solutions to the market and continued to develop them further. These solutions continue to meet the highest standards, even today. In 2005, the FEHLMANN technology center was opened. This building project was unique in Switzerland – fully air-conditioned and built to the latest technical



*Precision parts are manufactured and assembled to the ISO 9001 quality standard in the air-conditioned production halls.*



standards. All FEHLMANN product lines are available in the technology center for customer test cuts and demonstrations at any time. In 2006, Frank Fehlmann assumes leadership of the company from his father, Willi Fehlmann.

**VERSA/PICOMAX high-performance machining centers: Swiss-made from the Seetal in Aargau**

In 2020, the year of its anniversary, Fehlmann AG is now an ultra-modern machine builder, with 200 employees world-wide. Space is continually being expanded and processes modernized at the headquarters in Seon, Switzerland. The new assembly and production hall, along with the two Q measuring rooms, are air-conditioned and meet the latest standards. Our production facilities are state-of-the-art and can run automatically around the clock if necessary. In our vocational training workshops, we train most of our young, future FEHLMANN technicians ourselves, on the latest machines. We rely on the best-trained technical staff to develop and produce cutting-edge technology. Our most important potential for success is a motivated and competent team of employees that brings considerable expertise to the manufacturing of machine tools. Today, Fehlmann AG produces superior-quality machining centers and production systems with up to 5 axes. Our machines can also be fully automated, if desired, for complex and precise workpieces. Despite the high tech elements, however, we have never lost sight of our roots: the FEHLMANN PICOMAX 21-D/21-M and PICOMAX 56 TOP/56 L TOP series are perfectly suited for easy, efficient production of individual parts and small series. They are especially popular in the vocational training sector, prototype departments, R&D workshops, production facilities, etc.

**Customers are always our focus**

Our customers have high standards for FEHLMANN products and we meet them. From development, production and assembly, to training, commissioning and, finally, the entire customer service department, FEHLMANN customers get everything from a single source.

Dear customers, you place your trust in us every time you invest in a new FEHLMANN product. We are deeply grateful for this and want to thank you – especially in this year of our anniversary, 2020.



*5-axis machining cell with FEHLMANN multi-machine automated solution for machining sophisticated, precise workpieces around the clock.*



*FEHLMANN series PICOMAX milling/drilling machines for easy, efficient production of individual parts and small series.*



Picture: Matthias Böhm, SMM

## Frank Fehlmann: «The development is never finished»

Author: Matthias Böhm, editor-in-chief, SMM Schweizer Maschinenmarkt

**In an interview with SMM, Frank Fehlmann (CEO, Fehlmann AG) shows how the machine tool manufacturer has developed over the last 90 years and why the company relies on a high degree of vertical integration.**

### **What are the innovation drives in machine tool manufacturing?**

Innovations in machine tool construction are driven by the demands for steadily increasing productivity and performance. However, many innovations come from materials technology, specifically from developments regarding cutting materials and coatings. These days, the productivity of a machine is based on the speed, coupled with the accuracy, with which it can remove material. This is related one to one to the performance of the cutting material. If new possibilities are created here, a modern machine tool must be able to fully exploit the tools' potential, which then leads to higher torque, speed and acceleration.

### **No innovation without good designers – you obviously have good specialists.**

As a machine tool company, we enjoy an excellent reputation. We are technologically on a par with our competitors, some of whom are significantly larger. This is the success of our highly experienced, dedicated and loyal workforce. Without them, it would not be possible to succeed in the industry in the long-term. I would like to take this

opportunity to express my sincere thanks to them. Of course, this also applies to our design and development team.

### **How do you try to promote the affinity of the designers to the production processes?**

This is a very important subject area. Our design engineers are in close contact with our production technicians. Here we benefit from our high degree of vertical integration. Thanks to in-house production, our design department can obtain high-quality feedback directly from production. We try to integrate the expertise of our production processes into our projects at an early stage of machine development.

### **Speaking of vertical integration, you still develop and produce your own spindles. Why are you doing this?**

On the one hand, our high degree of vertical integration gives us the flexibility to react quickly to new developments. It also gives us important advantages in terms of delivery availability, quality and, most importantly, the ability to understand and optimize every detail of our products. The performance of the heart of a machine tool, the spindle,

is essential for this. This is where the accuracy, durability and process reliability of the machine are decisive. We want to keep these qualities in our own hands. Since 1996, with a few exceptions, we have been producing our motor spindles ourselves in air-conditioned workshops and on state-of-the-art machines. Today, the strategy of offering everything from a single source is more decisive than ever. When dealing with the complex production systems that a modern machine tool is today, customers are becoming aware of the advantages of placing the responsibility in our hands and not being passed around from supplier to supplier.

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*Customer confidence in the FEHLMANN brand is crucial. And trust is gained through consistent performance, honesty and competence.*

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### **Back to where it all began. FEHLMANN was founded 90 years ago. How did it all start?**

The company «W. Fehlmann Mech. Werkstatt und Apparatbau» was founded in 1930 by Wilhelm Fehlmann in Seengen. In the beginning, contract work was carried out. Later on, the company designed and manufactured its own range of machines, including drills, saws and vices. After his death in 1952, my father, Willi Fehlmann, took over the business in 1954. This year we are celebrating our 90th anniversary.

### **How did your father develop the company in the first 50 years, what were his main areas of focus?**

Willi Fehlmann completed his training as a mechanical engineer in Le Locle, one of the centers of Swiss machine tool manufacturing in the canton of Neuchâtel. Precision mechanics shaped his business idea, so that a new generation of machines, such as a table drilling and milling machine, as well as modular cross tables, were developed and produced. The focus was (and still is) on the precision and handiness of the machines. He wanted to give the operators the possibility to produce more quickly and to obtain precise parts without any effort. The first exports were sent to the neighboring countries.

### **At the end of the 70's, CNC technology came to machine tool construction. How did your company position itself in this sector?**

The era of NC technology at W. Fehlmann AG, which has been based in Seon since 1972, began in the early 1970s. First, with NC coordinate tables, which could also be used on other machines, e.g., on EDM machines. Later with the first NC machine PICOMAX 50 NC, which was presented at the EMO in Paris in 1975 – to the astonishment of many competitors. Few would have thought FEHLMANN capable of implementing this technology so early on. The FEHLMANN CNC machi-

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*No machine is newly developed at FEHLMANN without adding automation to the top of the list of required specifications.*

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nes had axes for round dividing and swiveling at an early stage. Thus, FEHLMANN positioned itself as a handy, universal and precise drilling-milling machine to economically produce smaller batch sizes with high precision. The fact that our relatively small company positioned itself so early in this new technology can justifiably be called pioneering.

### **What technological milestones would you like to highlight in the period between 1980 and 2010?**

Undoubtedly, the technologically profound change brought about by the increasing use of microprocessors. For FEHLMANN, the era of HSC technology and 5-axis technology began in the 90's. The first automated PICO-MAX milling cells were also introduced in the mid-90's.

That was the time of CIM euphoria, and for us, the birth of the milling cell control software «Milling Center Manager,» developed in our company. At the AMB Stuttgart in 2008, we presented the VERSA 5-axis machine for the first time, a machine tool which is designed for tool and mold making, as well as for series production.

### **The VERSA has put you in a new league of machine tool construction.**

The development of the VERSA was a quantum leap for our company and is the mainstay of our sales today. However, we will continue to have the existing PICOMAX machines in our range and will develop them accordingly. Preserving and further developing what is tried and tested, while at the same time opening up new fields. This is crucial for the future success of our company.

### **Can you describe the development of the FEHLMANN VERSA?**

The important thing is: a machine tool must be 100% convincing, both as a stand-alone machine and with an automation solution. And it must be perfectly tailored to the operator in its operation and handling. These are the basic requirements for every new development. Other criteria are taken into account, such as precision, machine size, interfering contours, tool storage, thermal stability, chip management and CNC controls. We develop the machine according to a complex catalog of requirements. Ultimately, a FEHLMANN machine must be designed such that the user can manufacture his range of components highly productively and economically – based on his precision requirements.

### **FEHLMANN has positioned itself well in the market. How do SMEs in Switzerland, as a high-wage location, remain competitive against the very strong global competition?**

FEHLMANN has been able to grow constantly over the past few years, and now has a workforce of around 200 people. But we remain true to our values. We want to be a strong niche player and not create flash-in-the-pan effects through sensationalism. I feel that the machine tool business is a long-term one, due to the longevity of the machines. Customer confidence in the FEHLMANN brand is crucial. And trust is gained through constant performance, honesty and competence. This begins with professional advice to the customer, delivery of a first-class product which, through competent training and commissioning, provides the customer with the benefits they expect. No less important is impeccable customer service, because we know that customers count on the availability of their machines. It is clear to us that in the end, it is always thanks to the customers that we receive our reward!

### **Over the years, FEHLMANN has had a relatively strong position in tool and mold making. Where did this focus come from and where do you see the positioning of your company today?**

Due to their precision and universal applicability, PICOMAX machines are ideal for precise parts to be produced in small to medium quantities. Due to their handiness, the machines are very popular, especially with practitioners and experts in mechanical cutting. This focus has been maintained until today, whereby the VERSA machines have allowed the addition of production applications in the automated 5-axis range. Today the VERSA series produces internationally successful top products. The machines are easy to automate and meet the spirit of the times by being configurable to specific customer requirements. As already indicated above, we want to maintain and further develop the tried and tested, but use the new possibilities of technology to offer our customers economical solutions that will take them further.

**Today, automation, process reliability and automated production play an essential role in modern manufacturing. To what extent does FEHLMANN have corresponding fields of competence in this regard?**

We have internalized this competence thanks to 25 years of experience in the automation of our milling cells. Hundreds of delivered automated FEHLMANN machines are proof of this. No machine is newly developed at FEHLMANN without adding automation to the top of the list of required specifications. In Europe, the only way to go is to automate. However, these complex centers also require very well-trained, entrepreneurially-minded specialists who can exploit the potential of such machine cells. This is where I see one of the greatest challenges facing our industry. We have to manage to get young people interested in our profession and not push all graduates to pursue an academic education at any price. The combination of practical knowledge and technical school education, such as that offered by the Swiss dual training system, e.g., for polymechanics, is, in my opinion, the ideal prerequisite for a successful career in the modern manufacturing industry.

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*Today, the strategy of offering everything from a single source is more decisive than ever.*

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**Which direction do you intend to take in the future regarding further development of machine tools?**

FEHLMANN has exciting projects in the area of new machine development, as well as many ideas about what could be improved and expanded. Development in machine tool manufacturing, which, as the Asians say, is the «mother machine of all products», never ends. Money is earned at the cutting edge. New cutting materials and cutting geometries and new CAM strategies that are allowed by modern machines today are only two important drivers of innovation. Megatrends such as Industry 4.0 will continue to influence mechanical engineering and industrial manufacturing. But we must never forget: It is always people who use machines and people who develop and produce them. Manufacturers must understand what will help users and recognize the useful possibilities offered by the advancing technology. The basis for our success is well-trained and experienced employees who perform loyally and at an optimal level.

**One last message for the 90th anniversary.**

I would like to thank all customers and suppliers for their loyalty and fairness, and all FEHLMANN employees for their great commitment over the years. We are pleased to welcome all customers and interested parties to our in-house exhibition on the occasion of our company's 90th anniversary (28–31 October 2020). Please register at [www.fehlmann.com](http://www.fehlmann.com)

**Sign up today!**



*Just scan the QR-code with your smartphone.*





## This autumn, FEHLMANN invites you to our in-house exhibition in Seon – this year entirely dedicated to our company's 90th anniversary

**From October 28th to 31st, 2020, we will be presenting modern technologies and solutions for machining various materials (carbide, graphite, CFRP and more) – together with some of our well-known partners in the fields of machining technology, clamping technology, measuring technology, CAD-CAM, CNC programming and automation.**

Alongside many highlights, such as «jig grinding on a milling center», we are pleased to present our latest development, the «FEHLMANN VERSA 945» for the first time! Find out about some of the highlights of this large VERSA right here in this issue on page 12.

The exhibition focuses on the following topics, in the form of interesting technical presentations and live demonstrations:

- Innovations and trends for demanding manufacturing processes in precision parts production and tool and mold making
- Interesting automation solutions for increased flexibility and efficiency in single part and series production
- Solutions and inspirations for practice-oriented modern training

The exhibition is supplemented by a special exhibition of FEHLMANN vintage machines, rarities and «special pieces». An anniversary lunch buffet and a leisurely get-together will round off this event.

We look forward to seeing you!

Please let us know the date you would like to attend on the enclosed registration form. Or you can order your personal invitation card with registration form electronically at [mail@fehlmann.com](mailto:mail@fehlmann.com)

### **Covid-19 protective measures:**

The health and safety of our customers, business partners and employees is our highest priority. To guarantee this, we are in strict compliance with the current recommended protection and hygiene regulations of the Federal Public Health Office (BAG).

We ask for your understanding that the maximum number of participants per day is limited.



## VERSA® machining centers in portal design



**VERSA 643 linear**

Precise and highly dynamic  
3-axis machining



**VERSA 645 linear**

Highly dynamic 5-axis  
machining



**VERSA 823**

3-axis version for work  
pieces up to 1000 kg



**VERSA 825**

Dynamic and high-  
precision 5-axis milling

## PICOMAX® machining centers and milling / drilling machines

### PICOMAX 56 TOP

The TOP machine for manual and CNC operations



### PICOMAX 21-D

Handy, robust and with a wide range of applications



### PICOMAX 56L TOP

Even more flexible and versatile in the L version



### PICOMAX 21-M

M-version with integrated motorized table – ultra-rapid, reliable and precise

### PICOMAX 75

Powerful solution for 3 to 5-axis precision machining

### PICOMAX 95

The all-rounder: 3 to 5-axis precision machining



## FEHLMANN VERSA® 945

# For high-precision 5-sided or 5-axis machining of workpieces with a swing circle of up to 650 mm in diameter

The new VERSA 945 rounds off the top end of the VERSA series. Workpieces up to Ø650 mm can be machined in 5 axes.

The outstanding features of the VERSA series also apply to this new development, such as the extremely stable portal design with 3-point set-up, the rotary tilting table integrated along the X-axis with cooled torque motors, the machine's optimal operator ergonomics and excellent visibility into the machining area, high dynamic accuracy, as well as maximum rigidity and precision.

Like all FEHLMANN production machines, the VERSA 945 can be easily automated at any time, either with pallet or workpiece changer. The tool-changing system with chain magazine and double gripper provides space for 48 tools as standard. Extended magazines for up to 400 tools are available as an option. The large VERSA machining center is also available as a 3-axis version (VERSA 943) with a table clamping area of 760 x 800 mm.

The fully digital Heidenhain control TNC 640 with 24" touch-screen (extended workspace) and the integrated machining cycles, specially developed by FEHLMANN, is perfectly matched to the VERSA 943/945.

### Come and join us for the launch!

This new development will be presented for the first time at our in-house exhibition from October 28–31, 2020.

Curious what the new VERSA 945 can do? Then come and visit us! Program and registration at [www.fehlmann.com](http://www.fehlmann.com).



## Turnkey automation solutions, all from one source – NEW for parts handling, too

For almost 30 years, Fehlmann AG has been offering modular automation solutions for the economical production of series and individual parts.

In addition to pallet-based automation, we now also offer robot-supported parts handling as individual turnkey systems. Together with you, we define a solution that is exactly matched to your needs.

On the left is the FEHLMANN PICOMAX 75 with the new, compact and modular 6-axis robot system for the all-round machining of circular as well as square blanks.

Increase your productivity and request an offer tailored to your specific requirements!

We'll be pleased to help you.

## Which fine-finishing machining process is the best for our application?

### Deciding between hard milling and coordinate / contour grinding requires the balancing of costs, machining time and precision.

When jig grinding meets high quality requirements, it is considered a difficult, complex and cost-intensive process. Hard milling, on the other hand, scores points with its economic removal rate, both when roughing and finishing. A combination of both processes on one machining center drastically reduces machining time, allows highly precise finishing and, at the same time, increased process reliability – as only one clamping is needed for the entire machining process.

### High-precision milling and coordinate grinding on the same machine

The FEHLMANN VERSA 645 linear boasts solid construction and impressive mechanical accuracy. High temperature stability with extremely low thermal growth is another one of the outstanding features of this versatile machining center in portal design – making it the ideal machine to use for jig grinding.

The FEHLMANN VERSA 645 linear with jig grinding function was presented at EMO Hannover 2019. This technology enables complete machining of difficult-to-machine materials such as high-strength metals and brittle materials in one clamping. Parts can be precisely pre-milled before grinding, ensuring a perfectly pre-finished part. Varying offsets caused, for example, by warpage during hardening, can be eliminated. The free choice of the most suitable machining strategy and the automatic dressing of the grinding pin guarantee consistent excellent surface quality and contour accuracy.



## Electric spindle for FEHLMANN VERSA 643 / 645 linear – for even more flexibility



**For milling and grinding operations with smallest, very fine and extremely high speed tools, it is possible to additionally equip the VERSA 643/645 linear with HSK-E50 motor spindle with an electric spindle with up to 80 000 rpm. This allows an even wider range of application and more versatile use of the highly dynamic FEHLMANN machining center.**

Implementation is simple and practice-oriented: the electric spindle is called up like a normal tool and automatically changed into the spindle.

The desired speed is pre-selected in the program and the electric spindle is switched on and off via a M-function. The electric spindle is marked as a special tool in the tool table. As a result, the FEHLMANN VERSA 643/645 linear automatically takes any zero point offset into account.

Automatic measurement by laser is also guaranteed. If the machine is equipped with dynamic collision monitoring (DCM), the contour of the electric auxiliary spindle is also taken into account.

## A unique combination of machining centers are convincing in terms of flexibility and precision

Pictures and text: Manfred Lerch, Redaktion Lerch

**A machine should be replaced due to its age and, in a further step, capacities increased with a larger machine. Also, the product range should be improved upwards. WESKO in Stollberg / Germany opted in favor of the FEHLMANN VERSA 645 linear 5-axis machining center and, 12 months later, the FEHLMANN VERSA 825. The list of requirements for these investments was long. The decisive factor for increased flexibility was the combination of a small and a large machine, together with an automation solution.**

Today, when comparing machine tool manufacturers within the same category, the differences are usually minor. At least, that is how Roland Sandmeier, of Export Sales NW Europe at FEHLMANN, sees it. When investing in two machining centers, WESKO saw these details in terms of a high degree of flexibility, compactness and ease of operation of the entire machine cell. However, for Heiko Lehm, Head of Toolmaking at WESKO, these details are of enormous importance: «First of all, the second machine was not installed until one year later. The current machine cell configuration, however, was planned from the beginning and everything was prepared accordingly. As a result, one year later, the VERSA 825 could be commissioned in only four days. And so to the seemingly small details: it was important to us for the machine operators to have a clear view of both machining centers, including the Robot Compact 80, from the front. Another criterion for the decision, however, was the linear drives. These not only allow for faster traverse movements, but also provide more precise imaging in corner areas, thanks to the uniform speeds. This means that we can achieve our tolerances of 1/100 mm reliably and permanently. Even in the unmanned night shifts.»

In Stollberg, manned machining is now happening in two shifts, while the night shift is used for electrode production. This machine cell is excellent in terms of compactness and ease of operation – comparable machines with integrated automation are usually set up offset by 180°. FEHLMANN, on the other hand, has succeeded in positioning the machines with the Robot Compact 80 so that the operator always has a good overview of both machines. Roland Sandmeier explains: «It may sound strange, but we take the details of how a machine can be automated and operated into consideration beginning with the first drawing done by our design engineers. This is also the reason for our unique selling point regarding the compactness of the machining cell concept.»

### Just one try, then the quality must be right

Currently, since spring 2018 and October 2019, respectively, 70% of the highly complex mold inserts (soft and hard up to 60 HRC in some cases) for injection molding tools, small series and copper electrodes are being produced on the two machining centers in WESKO's toolmaking division. Copper electrodes are used because they allow you to see very precisely where erosion is taking place; for example, when making dimensional corrections. Eroding machines also sometimes produce better results – finer textures can be produced and wear is also kept within limits. The proportion of copper electrodes on the machining centers, however, is only around 30 percent.

*«That's how the machining cell was envisaged from the start. FEHLMANN has already commissioned and tested this configuration at the factory. That's why the VERSA 825 was ready for operation after four days.»*

*Heiko Lehm, Head of Toolmaking at WESKO*



The machine configuration was planned this way from the start. Investments in the VERSA 645 linear were made in spring 2018 and this was supplemented with the VERSA 825 in October 2019.



A small challenge for Fehlmann: 320 x 320 UPC pallets, ITS 85 and 148 as well as electrode holders are used.



These are often highly complex workpieces for which tolerances of 1/100 mm are specified. This means that precision is the main focus at WESKO.

In order to cover the entire product range with the two machines, the company in Stollberg opted for one large and one small machine. While the 20 000 rpm VERSA 825 is also used for roughing and larger components, the 30 000 rpm VERSA 645 linear is also used for HSC machining. This necessary variety of machining options was a slight challenge for FEHLMANN, as 320 x 320 UPC pallets, ITS 85 and 148, as well as electrode holders, are used at WESKO. All this equipment, therefore, had to be integrated into the Robot Compact 80 – with a floor space of only two m<sup>2</sup>.

In Stollberg, in spite of the VERSA 825 machining center's powerful HSK-A63 motor spindle with a torque of 120 Nm, the focus is not on metal removal rates. It is primarily on highly complex workpieces, where precision is the main focus. This is a fact that Heiko Lehm regards pragmatically: «In contrast to series production, in toolmaking we only get one try and then the quality of the workpiece must be right. That's why we wish to achieve our required tolerances reliably. Clamping devices and milling tools must, however, also be taken into account here. FEHLMANN, though, is known for precision anyway. It makes little sense then to push the machine to its limits. We regard a 10-minute longer running time to be irrelevant, because we achieve the necessary efficiency through automation.»

80 percent of WESKO's business is now focused on the design and manufacture of injection molding tools and 20 percent on the manufacture of parts. This parts manufacturing is mostly concerned with pilot series of connectors. Manufacturing is also carried out here using FEHLMANN machining centers, a PICOMAX 60 and 90, also with automation. Machines that have been in operation for more than 10 years continue to mill with the required precision and are also used for automation courses for trainees.



*The decisive criteria for the machining cell were compactness and the operator's ability to always have an overview of both machines.*



*The linear drives not only achieve faster traversing movements, but also allow more precise imaging in corner areas. Tolerances of 1/100 mm are thus achieved reliably and permanently.*



*The two machining centers are utilized 30 percent with the milling of copper electrodes. Independently of this, WESKO also manufactures graphite electrodes, but on a different machine.*

### Interesting side notes

With the pilot series, WESKO produces prototypes of the series part right at the beginning of the design process, which allows the required functional properties to be checked at an early stage.



*Heiko Lehm (left) and Roland Sandmeier (right): «The combination of a small and a large machine with automation in this compact design and with operation from the front, including linear drives, is unique – but certainly necessary for the desired flexibility».*



*ETH Prof. Dr. Konrad Wegener (left) and CEO Frank Fehlmann (right).*

### Inauguration of FEHLMANN VERSA 645 linear at ETH Zurich

The inaugural celebration of the FEHLMANN machining center VERSA 645 linear took place at the ETH Zurich's IWF Institute for Machine Tools and Manufacturing in April 2019.

The purpose of this machine is to further projects regarding the topics 5-axis machining, measuring technology and controls technology. The festivities were rounded out with a demonstration of the measuring systems and the milling of a Matterhorn model.



## Swiss benchmark in dynamics drastically reduces machining times

Pictures and text: Manfred Lerch, Redaktion Lerch

**Expanding capacities and reducing machining times were the objectives in Schinznach-Dorf when the company invested in two VERSA 645 linear 5-axis machining centers in 2018 and 2019. And they are now allowing the company to operate at the highest level in terms of dynamics, feed rate and stability. The interesting thing is that at Amsler & Frey the focus is on plastic parts – materials that are not always easy to machine.**

In Schinznach, however, the company is continuously investing in the latest technology, and so, in 2018, Operations Manager Thomas Gloor saw it as time to replace the two PICOMAX 90 machines in the automated production cells after more than 10 years. Therefore, despite the consistently positive results experienced using the two machines, an intensive benchmarking program was started. The aim was to expand capacities with the existing automated systems and to reduce machining and set-up times. Amsler & Frey is not necessarily looking to achieve a one second per component processing time. For Thomas Gloor, however, this was still part of the benchmark: «Although we do also work using comparable machines from

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*«The large reduction in machining times is a result of the huge dynamic capacity of the machines, the high feed rates, but also, substantially, of the set-up times».*

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competitors, the VERSA 645 linear was the absolute benchmark for us in this performance class for 5-axis machines. This begins with connection to our existing automation unit and continues with the dynamics and the torque drives in the rotary and swivel movement. In making this investment, it was also our intention to plan for the future, for more series parts and components designed for automation. Irrespective of this, service is also hugely important to us. And in this area, our experience with FEHLMANN has been very good.

The variety of plastics to be processed at Amsler & Frey is virtually unique. This ranges from soft materials that are still fluid after machining and exhibit very high deformation, to abrasive carbon-fibre alloys and rock-hard epoxy glass. While some plastics produce very long flow chips, the machining centers for hard plastics have to provide appropriate stability. There are no recommended cutting data or books of tables. Everything is based on experience. But it is also a fact that only dry milling with air cooling is carried out in Schinznach. This is a tricky situation, especially at night, when machining is carried out unmanned.

But Michael Rüthi, Head of Milling Automation, does not see this as a problem: «We machine components with tolerances of a few hundredths of a millimeter. At night we also operate unmanned at up to 30,000 rpm and high feed rates. But the machines and spindles are absolutely stable.»

### Extremely flexible in automation too

However, those responsible at Amsler & Frey do not regard the huge reduction in machining times as being down only to the machine speeds or high feed rates alone. It is mostly due to the set-up times and the dynamics of the machines. The tool changer with 200 pockets contributes to the set-up times. Marcel Heiniger, Production Workshop Manager for the VERSA 645 linear, regards the dynamics as a major factor: «The differences in



*In 2018 the company invested in the first VERSA 645 linear 5-axis machining center, followed by the second in 2019. Both machines are connected with a Robot Multi (ERM) from Erowa.*

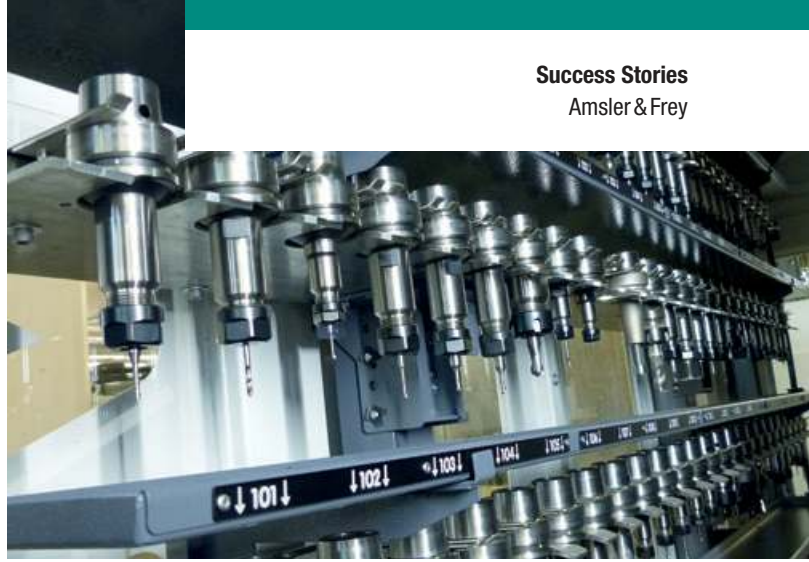


*The two machining centers now allow the company to operate at the highest level in terms of dynamics, feed rate and stability.*





Jürg Solenthaler, Michael Rüthi, Marcel Heiniger und Thomas Gloor  
(from left to right):



The set-up times were drastically reduced by the tool changer with a capacity for 200 tools.

speed, feed rates or dynamics are striking compared to the older machines. But these factors are necessary for the machining times. As an example, we have more than halved the processing time for a medical technology component that has many 3D contours. That means we were able to reduce the time per pallet from three hours to 80 minutes. For me, the VERSA 645 linear is unique in this performance class.»

Another advantage of FEHLMANN's machining centers, however, is the flexible automation options. At Amsler & Frey the batch sizes vary greatly – from prototypes up to more than 10 000 pieces/year. There are often 10 to 20 series with up to 10 different types/sizes. This is also why automation is not made dependent on the batch sizes. So far, with the Robot Multi (ERM) from Erowa, with 75 pockets for 148 mm pallets and 5 UPC pallets, we are in a good position. And, if you want to expand or replace this automation, this is not a problem either with the two VERSA 645 linear machines. This automation has been supplemented with the MCM™ (Milling Center Manager). The master computer system controls and monitors the machine and robot. The machining sequence, zero points, etc. are also entered in a clearly arranged job table.

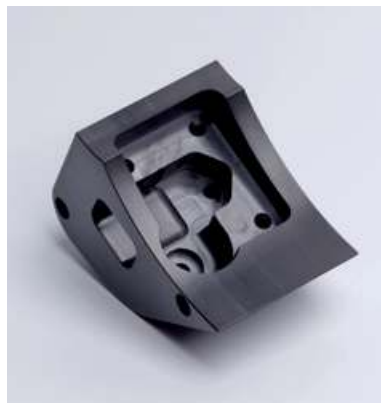
The Schinznach-based company is thus more than satisfied with its investments in the two machining centers. Especially since, according to Thomas Gloor, the VERSA 645 linear can also be used for production without optional add-ons, compared to comparable offers: «Of course, FEHLMANN is well-known for precision. But price and service were also important for us with this benchmark. And we were surprised by the price, because FEHLMANN was definitely competitive with comparable machines».

### Amsler & Frey AG in the spotlight

Amsler & Frey is an independent Swiss family-owned company that has been operating successfully nationally and internationally in the plastics industry since 1968 and employs more than 60 people. Their customer base includes companies from a wide range of industries, such as mechanical and equipment manufacturing, medical technology, analysis, sensor and laboratory technology, as well as electrical and materials handling technology, energy supply and the public sector. In the field of finished parts, Amsler & Frey specializes in dry machining. The advantage of this process is that the plastic parts are not contaminated by coolant. This eliminates material damage from oil contamination. The machine fleet in the milling shop comprises 14 CNC machining centers with 5-axis technology and different specializations. The company is ISO 9001 and ISO 13485 (medical products) certified.

### By the way

Jürg Solenthaler, Head of Sales for Switzerland, says: «For us, toolmaking is the benchmark when it comes to precision and surface quality. These include, for example, tools from the Heidenhain controls series or the high-precision pack-



The variety of plastics to be processed at Amsler & Frey is unique. From soft to abrasive and rock hard. There are no recommended cutting data or books of tables for this. Everything is based on experience.

ages. Parts manufacturers such as Amsler & Frey, of course, also benefit from these features».

With a total of three automated cells, Amsler & Frey covers 50 percent of their total order volume in the milling sector.

### Interesting side notes

Due to the huge variety of parts, a multi-machine connection to an automation system would not pay off for Amsler & Frey. The set-up time and labor involved would be too high and the capacity of the robots too small.

Read about other interesting customer experiences in the section «Media» on [www.fehlmann.com](http://www.fehlmann.com).

## FEHLMANN is building for an innovative and strong location

**FEHLMANN is strengthening the foundation of its Seon location with ongoing investments, modernisation and expansion. A lot has happened in the past two years:**



*Renovation of the facade on the south side.*

*The new «Alpenblick» conference room provides ample space for meetings and discussions.*

Just in time for the FEHLMANN in-house exhibition in November 2018, we were able to put our new «Alpenblick» customer and conference room into service after a construction period of only 5 months.

The completely new conference room, built on top of the original building, offers a bright, spacious and air-conditioned infrastructure with large windows. It provides space for up to 20 people, as well as a refreshment and viewing area on the covered 50 m<sup>2</sup> terrace. Wheelchair access is a matter of course.

The new construction of the 5th floor goes hand in hand with far-reaching renovations of the 2nd, 3rd and 4th office floors. Contemporary LED lighting, a cooled ceiling that ensures draught-free air conditioning, state-of-the-art IT infrastructure and triple-glazed windows offer generous and bright office space.



## High Precision Showroom (HPS)

Expansion of the FEHLMANN Technology Center in 2020:

Visitors can look forward to a new showroom for the highest level of FEHLMANN precision, the «HPS» High Precision Showroom, in the basement.

This area, which has no basement and is not exposed to direct sunlight, provides the optimal conditions to test and experience the full dynamics and performance of our machines.

## Environment and sustainability

Dealing responsibly with the environment and nature has been an important component of our sustainable environmental and quality management for years. We are, therefore, delighted to have successfully passed the re-certification of ISO 9001:2015 and ISO 14001:2015 in February 2020.

## State-of-the-art means of production for top quality



### Portal surface grinding machine 1000 x 2500 mm in summer 2019

Commissioning of the new grinding machine:

- With a grinding range of 1000 mm across and 2500 mm lengthwise.
- Machine frame made of granite guarantees very good damping properties and highest level of stability.



### New purchase 2020: PRISMO ULTRA measuring machine from Zeiss

The new measuring machine is a step into the future – with a measuring accuracy of one thousandth – it is one of the most accurate machines on the market in this size of 2400 mm. Highest precision for FEHLMANN quality components.

### Optimal air conditioning and stable ambient temperature in the assembly hall of the PICOMAX 56 TOP series and PICOMAX 75

Like the other production halls, the assembly hall of the PICOMAX 56 TOP and PICOMAX 75 has also been equipped with energy and resource-saving air conditioning.

## FEHLMANN Customer Service – competent and uncomplicated

### An important component in the FEHLMANN service concept is our Customer Service Department as a contact and coordination point.

Our well-trained technical support staff will actively assist you in troubleshooting in case of problems. A fault can be localized efficiently by clarifying the problem over the telephone and, in many cases, it can be rectified by competent advice directly on the phone. In addition, modern means of communication allow remote diagnosis of your machine if required. This considerably reduces both downtime and costs.

As the manufacturer of FEHLMANN machines, we have an extensive stock of spare parts. Parts and components from stock can be delivered very quickly from our factory in Seon (Switzerland) and/or directly from your local representative. Our express delivery services allow the delivery of spare parts practically anywhere in Europe within 24 hours upon receipt of a customer order.

#### FEHLMANN Customer Service as the contact and coordination point for:

- Spare parts management and logistics
- Coordination of service calls
- Competent fault clarification (hotline) by telephone / remote diagnosis



#### The new head of the FEHLMANN Customer Service introduces himself

Since the beginning of this year, Manuel Bach has been the new head of our Customer Service Department.

He previously worked for us for a long time as a service and commissioning technician as well as a technical customer support/hotline employee. Manuel Bach is, therefore, well-acquainted with the challenges of our industry

and the needs of our customers. He is looking forward to his new role and will be happy to assist you as a technically very experienced contact.

#### You can contact Manuel Bach and his team as follows:

Fehlmann AG Maschinenfabrik 5703 Seon Switzerland	Monday to Thursday: 8 am to 12 pm 1 pm to 5 pm
Telefon: +41 62 769 12 80 Telefax: +41 62 769 11 93 service@fehlmann.com	Friday: 8 am to 12 pm 1 pm to 4:15 pm

## FEHLMANN website fehlmann.com

### Already know about the «Media» section on fehlmann.com?

There you will find exciting reports regarding real-life applications and challenges, informative media articles and publications as well as, among other things, this current issue of the FEHLMANN customer magazine REPORT as a PDF download.

### Experience the FEHLMANN machines in action:

Watch the product videos at fehlmann.com «Products/Videos» or on our YouTube Channel.

Simply scan  
the code with  
your smartphone  
camera.



We show you various examples of machining, such as «Milling and Grinding on One Machining Center», «High Dynamic Cutting» or «Manual and CNC work...» as well as many other potential applications for our machines.

### Speaking of web presence:

What do you think of our website? We would like to know your honest opinion and criticisms about using it.

Can you find what you're looking for? Do you have any suggestions for improving the website?

Then simply send us an **email at mail@fehlmann.com**. We are interested and look forward to your feedback!



Your Precision Advantage.®



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