

# User report

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F. Zimmermann: Schröter Modell- und Formenbau GmbH gears up for rising order volume with completely newly developed portal milling machine

## Less rework thanks to innovative machine technology

**Schröter Modell- und Formenbau GmbH has been relying on Zimmermann for decades. During the corona-related crisis, the company invested in a completely newly developed five-axis portal milling machine from the Swabians. The special feature is its (thermo)symmetrical design with a center-guided Z-slide. This enables Schröter to achieve significantly higher accuracy. The symmetrical design and the innovative guide arrangement increase stability and also save weight - making the machine more dynamic, productive and energy-efficient.**

How do processing companies react correctly in times of crisis? "Many think in the short term, cut costs across the board and even reduce staff. When the industry booms again, they are not prepared for a sudden influx of orders and usually have to turn down projects because there is simply no capacity available," Maximilian Lörzel has observed among many market competitors. On this day, the managing director of Schröter Modell- und Formenbau GmbH in Oberpframmern near Munich in Bavaria is sitting in one of the meeting rooms of F. Zimmermann GmbH in Neuhausen auf den Fildern, almost 230 kilometers away, not far from Stuttgart. "We were faced with this question in November 2021: How do we react to the Corona pandemic, which worsened the order situation and forced us to introduce short-time work?" he says. No one could assess the situation. But we knew: At some point, the crisis will be over. And we wanted to be prepared for that." Uncharacteristically for this time, he decided to invest in a new FZP32 series portal milling machine from F. Zimmermann with a working area of 7,000 x 3,500 x 2,500 millimeters. This was certainly a risk, but it was also a clear signal for the future, to our customers and our employees," he says today.

In 1963, Lörzel's uncle Bruno Schröter established the company in Munich. At the beginning of the 1990s, he took over the business, which has been growing steadily ever since. Today, the company manufactures components or molds for prototypes, but no series. It also makes foundry and design patterns, sheet metal forming tools made of aluminum or plastic, and processes softer materials such as foam, clay and ureol. Schröter also processes carbon fiber and steel. "About 50 percent of our customers are from the automotive industry," reports

## User report

Managing Director Lörzel. "Among them are names such as BMW, Audi, Volkswagen, Mercedes and Porsche. By 2022, the company will have milled nearly 70 one-to-one models. However, he says, his company does not want to be dependent on one industry. Diversification is important, he advises. That's why nearly 40 percent of orders now come from aerospace. A new growing field is medical technology. Here, he and his 40 employees take on the production of complex prototypes for computer tomographs or surgical robots, for example.

### **Stable, fast and flexible machines**

Back in Neuhausen. "What makes us so successful?" Schröter's managing director doesn't have to think long. "We have highly qualified employees. Every one of them can both program and operate the machines. We train ourselves and offer complete manufacturing from a single source." For design and five-axis NC programming, the company relies on Catia and Tebis software solutions in combination with F. Zimmermann milling machines. Schröter grew up with the Swabian machines. What Lörzel appreciates about them is the stability, high speed and flexibility of these machines. They work precisely and reliably. "The components hardly have to be reworked at all after being removed from the machine, depending on the working time. This alone saves us considerable time and money," emphasizes the managing director.

In 1991, Schröter Modell- und Formenbau invested in the first milling center of the Swabian family-owned company. In the meantime, there are five Zimmermann machines of different sizes in Oberpframmern - just as many fit in the hall. "Because we rely on machines from the same manufacturer, we can pursue a common parts strategy," describes Lörzel. This means that if one machine breaks down, an employee can simply switch to another machine of the same size with the component. For this purpose, these machines are equipped with the same control system, comparable milling heads and simulation software from Tebis.

### **Machinery continuously renewed**

In more than 30 years, Schröter has replaced four machines with newer versions. "Now it's the turn of the fifth and thus the ninth Zimmermann machine," says Lörzel, looking over at Frieder Gänzle. The Managing Director of F. Zimmermann GmbH is meeting with him today for the acceptance test of the new FZP32. "The old FZ37 series machine that we are now taking out of production in Oberpframmern is 18 years old," says Lörzel. "It is still running reliably. But of course, due to its age, small signs of wear and tear always occur, sometimes it was a defective power supply, sometimes the graphics card." With the new FZP32, the

## User report

same workspace is available to him. Components such as vehicle models can be completely machined from five sides without reclamping. The modular design of the machine makes it possible to incorporate various options - for example, automation solutions such as shuttle tables, a positionable rotary table, dust extraction bells or an individualized mold clamping system. Most importantly, however, Schröter is taking a significant step forward, as the new portal milling machine achieves maximum dimensional accuracy when machining workpieces. "This is due to its thermosymmetrical design," says Zimmermann Managing Director Gänzle, explaining the special concept.

### **Thermosymmetry for greater precision**

Changing ambient temperatures as well as process heat inevitably influence the machine geometry with conventional gantry design. The idea behind the thermosymmetrical design is based on the fact that thermal influences occurring can be absorbed to a considerable extent by the design of the machine structure. "To this end, we have designed and intelligently arranged structural and drive components, guides and other accuracy-determining components accordingly in the machines of our entire advanced portfolio. This allows the structure to expand in non-critical directions," Gänzle describes. The center-guided Z-slide of the gantry in double-bridge design has an octagonal cross section, which makes it particularly stable. With this design, we achieve very high stiffness. And because there can be no one-sided heating, this increases accuracy enormously. Zimmermann's design of the structure reduces the effects of error influencing variables to a minimum. And because there are fewer leverage forces compared to a serial structure with a classic guide arrangement, the machine builder can build the FZP more rigidly: The octagonal Z-slide is more stable and yet slimmer. And because less mass has to be moved, the machine works faster and more dynamically - making the operator more productive. A lower mass to be moved also requires less energy. These are clear cost advantages. In addition, the thermosymmetrical design eliminates the need for complex cooling circuits, which also has a positive effect on costs.

### **Milling with brains**

The FZP is set up for acceptance in the hall in Neuhausen. Frieder Gänzle points to the milling head: "The VH10 is in use. The fork head is a monoblock design made of cast iron. It is compactly built, achieves high clamping forces and thus enables stable component machining." Zimmermann optionally equips the VH10 with process cooling with cooling lubricants or even minimum quantity lubrication. To reduce throughput times, a powerful spindle with 34 kilowatts at a maximum speed of 24,000 rpm is installed as standard. This is

# User report

complemented by an optional dust extraction bell around the milling tool. Also important for customers

## **Safe in the Ghost Shift**

The new FZP concept has convinced Maximilian Lörzel. "Especially when we run the machine for seven hours at a stretch at night, we have to make sure that it remains temperature-stable over this long period," he says. It's even more extreme on weekends, he adds. That's when run times of up to 40 hours at a stretch can accumulate. First the system mills one side of a vehicle, then the other. If a small temperature imbalance arises as a result of the long running times, a small step occurs on the rear side of the model. With the new thermostable machine, this rework is almost completely eliminated. In addition, the effort required for programming in advance is reduced, since less consideration has to be given to the thermal behavior of the machine.

In Oberpfraammern, the FZP will be placed on the foundation of the old plant. Therefore, the size of the machine was already determined. The machine table will also be taken over. Due to the tight space conditions, the control and media cabinet will be placed on a pedestal.

## **Investment pays off**

The investment in the new FZP was supported by the German government at a time of crisis. The aim was to make the German economy, and in particular small and medium-sized businesses, competitive again with modern technology. "That made the decision easier for us, of course," recalls Lörzel. "And we knew, after all, the topic would be on our to-do list in the next three to five years." He expects the FZP to pay for itself after about eight years. "Of course, nobody knows what the market will look like in three years. But since the summer of 2022, the order volume has been rising steadily again," says Lörzel. Schröter even recently won two new customers from the aviation industry and medical technology based in the USA. German thoroughness is still in demand, he says happily.

This also fits well with the new FZP32, on which the model and mold makers will also partially mill components for helicopters and airplanes - among others for companies such as Airbus. Recently, customers have also included Rolls Royce Triebwerkstechnik in Berlin. Typical components include covers for the engines, which have to be milled very precisely and, if possible, without offsets. Lörzel: "With the current order situation, we expect the automotive industry to produce 60 to 70 models for complete cars per year. We are also using the new FZP32 for this." Schröter is planning a two-shift utilization of the new line,

# User report

possibly even a ghost shift - depending on the range of parts. This adds up to around 3,500 to 4,000 operating hours per year.

## **Service makes the difference**

Lörzel has been enthusiastic not only about the machines for the nearly 30 years he has been in business, but also and above all about the service: "We get an answer right away - and not in Italian or Chinese - in Swabian when in doubt." All of his equipment is networked online with F. Zimmermann in Neuhausen. If a problem arises that he can't solve himself with his people, the specialists connect to the plant.

"Now we only have one challenge left," says Managing Director Lörzel. "When we built our hall in 2005, the old FZ37 was the first machine in the room - so it is at the very back. The other four milling centers are in front of it." When dismantling the old machine and installing the new one, the managing director and his staff therefore have to be clever - but that's actually part of their daily business.

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**Meta-Title:** Model and mold maker invests in thermostable portal milling machine from Zimmermann

**Meta-Description:** Schröter Modell- und Formenbau invests in new FZP32 from F. Zimmermann. The 5-axis portal milling machine with thermostable design is more accurate, lighter and therefore more dynamic and energy-efficient.

**Keywords:** Keywords: zimmermann; schroeter model and mold making; aircraft industry; FZP32; 5-axis portal milling machine; thermostability; portal milling machine, CNC.

# User report

## Captions:



**Fig. 1:** Schröter Modell- und Formenbau is a leader in the manufacture of molds for the entire automotive industry. For racing, the company manufactures models, molds and tools for the complete carbon fiber body and for all engine and interior components.



**Fig. 2:** The FZP32 5-axis portal milling machine is very accurate thanks to its thermosymmetrical design. It offers high productivity and availability.



**Fig. 3:** The machine is still in Neuhausen. In Oberpfammern, Schröter will be able to machine complete vehicle models from five sides in a single setup.

## User report



**Fig. 4:** Maximilian Lörzel (left) and Frieder Gänzle: "In addition to a high power density, the focus during development of the VH10 was primarily on its slim line."



**Fig. 5:** The new system is equipped with Tebis simulation software, among other features.

### About F. Zimmermann

F. Zimmermann GmbH, based in Neuhausen a.d.F., close to Stuttgart, is a leading global high-tech supplier of portal milling machines. These are characterized by maximum accuracy with huge working spaces, enormous dynamics and cutting performance. The company, founded in 1933 by Friedrich Zimmermann, now has over 140 employees worldwide. With its product range, the innovative company has one goal above all: to offer the right solution for its customers and thus to be able to guarantee high economic efficiency. "Quality made in Germany". The special machines are used worldwide in the automotive, aerospace and mechanical engineering sectors.

Please visit for more information: [www.f-zimmermann.com](http://www.f-zimmermann.com).

# User report

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