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Off-the-shelf medical instruments
Healthy business and high-quality tooling

Tschida Medical Solutions' entry into high-precision
manufacturing with Bumotec s191



Educational: For one year, Peter Tschida and his sons Florian (pictured) and Maximilian learned how to produce medical instruments with the 7-axis s191 Bumotec machining centre to μm precision.

The world's most impressive *Swiss army knife* weighs more than four tonnes and can turn, mill, grind, bore, broach, saw, skive and even needle-etch with backlash-free precision to the micrometre: This was reason enough for surgical mechanic Peter Tschida from the district of Tuttlingen to order the Starrag Bumotec s191 mill/turn centre – the *Swiss army knife* of machining.



Peter Tschida: *“The boldest thing about this machine is that all of the know-how remains in-house. We will continue to work through the puzzle under the radar until the innovation is fully developed.”*

Five years ago, Peter and Ivonne Tschida, owners and founders of Tschida Medical Solutions (TMS) in Fridingen (near Tuttlingen), made a very courageous decision. The family-owned company, located in what is often referred to as the *Medical Valley* in the Swabian region of Germany, decided that it wanted to go beyond inventing, developing and designing medical instruments made of stainless steel using 3D CAD, it also wanted to manufacture them itself using the Bumotec s191 high-precision mill/turn centre from Starrag. This took a great deal of courage, as Peter and his sons Florian and Maximilian were total laymen in the fields of CNC machining and CAM programming.

High precision with many extras

However, after around a year of training, with newly acquired knowledge, the Bumotec s191 and its many extras quickly opened a door into the world of CNC machining. The linear-driven mill/turn centre can load and machine bar parts with a maximum diameter of 50 mm, and the multi-grip device on the opposite station holds and supports complex parts very reliably, ensuring that very tight tolerances can be maintained even with 6-sided machining. It also reduces unproductive set-up times: *“We can mill up to nine components in the turret at the same time. This means we can avoid*





eight tool changes compared to individual production,” explains Tschida with a practical example.

Manufacturing costs in Fridingen are high, as instruments such as forceps, scissors and needle holders are produced from high-alloy stainless steel bar parts (X20Cr13, Ø 25 mm), which Tschida Medical Solutions then combines into complex micro-spring, micro-bayonet and tube shaft instruments. Tschida’s team manufactures these components in series production 24 hours a day – even through the night during fully automated, unmanned shifts. Precise temperature management ensures safe and reliable repeating accuracy with precision to two micrometres on all five axes, while the stable and low-vibration machine bed offers near-net-shape finishing on the surfaces. But Tschida is especially proud of one thing: *“The boldest thing about this machine is that all of the know-how remains in-house. We will continue to work through the puzzle under the radar until the innovation is fully developed.”*



Tooth by tooth: The Tschida team is proud of the atraumatic DeBakey forceps, a double-articulated instrument with two jaws and special teeth for picking up and holding very sensitive blood vessels safely.

Success story: DeBakey forceps

So-called atraumatic DeBakey forceps, a double-articulated instrument with two jaw parts, were selected for manufacturing as a trial. This instrument is given special teething for picking up and holding very sensitive blood vessels safely. These tiny (less than 0.4 mm wide) cross teeth are milled using special tooling; they have a very small radius and interlocking, backlash-free longitudinal teeth on opposite jaws. In order to reduce the amount of work required, the s191 finishes the inner sides of the jaws so well that they do not need to be polished at the end of the process.

The case study was successful and Tschida will soon be able to supply its distributors with these DeBakey forceps, which stand out from the

competition thanks to their high-quality toothing. *"It's not uncommon for the jaw parts to decay," explains the surgical mechanic. „It only takes a few teeth to be missing or incorrectly positioned for the forceps to injure vessels."*

Despite the significantly higher manufacturing costs, the case study showed that the s191 produces these parts very efficiently (four parts in a turret). The DeBakey forceps are testament to what the s191 is capable of. Tschida: *"The required form and quality of the individual parts remain consistently high in series production. The case study also shows us how to reduce the time required to refine the parts. In addition, the final assembly times are reduced, as the parts fit together and the desired function is achieved more quickly."*

Company profile Starrag High-precision machine tools for greater productivity

Starrag Group is a global technology leader in manufacturing high-precision machine tools for milling, turning, boring and grinding workpieces of metallic, composite and ceramic materials. Principle customers are internationally active companies in the Aerospace, Energy, Transportation and Industrial sectors (Industrial Components, Luxury Goods, Med Tech). In addition to its portfolio of machine tools, Starrag Group provides integrated technology and maintenance services that significantly enhance customer quality and productivity.

The umbrella brand Starrag unites the product ranges Berthiez, Bumotec, Dörries, Droop+Rein, Ecospeed, Heckert, Scharmann, SIP, Starrag, TTL and WMW. Headquartered in Rorschach/Switzerland, the Starrag Group operates manufacturing plants in Switzerland, Germany, France, the UK and India and has established a network of sales and services subsidiaries in the most important customer countries.

The shares of Starrag Group Holding AG are listed on the SIX Swiss Exchange.

Medical Valley: The district of Tuttlingen (pictured: the town of Fridingen) is responsible for around half of the world's sales of surgical instruments.



For further information

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