

FIBROMAX

## **More efficiently to $\mu$ in the heavy-weight league**

**How can precision components up to 60 t be manufactured rationally in the lowest possible quantities? Machine and plant builder FILL from the Austrian town of Gurten in the Innviertel took control of the situation itself without further ado. Together with large machine specialist SHW, it developed a universal gantry milling machine that can process workpieces that weigh tons both precisely and efficiently. At its heart is a practically maintenance-free positioning table with a large roller bearing from the rotary table specialist FIBRO.**

The enthusiasm of Günter Redhammer, Team Lead for Parts Manufacturing, for the the SHW PowerBridge concept is clear to see from the first moment on. It's no surprise: The over 21m-long, universal gantry milling machine with orthogonal milling head, two processing bridges, travelling tool robot, and control stand, as well as synchronous tool change and automatic milling head change permit extremely short setup times and precise results in small-batch manufacturing.

### **Setup time of just just a few minutes**

Instead of setting up the extremely heavy components onto a machine support system with a lot of effort using a crane and dial, which can take several hours at the best of times, the parts are now set up on pallets outside of the machine during the main productive time. Using a zero position chucking system, they can be switched over to the FIBROMAX heavy-weight positioning table in just a few minutes. "As a manufacturer of large individual parts, I have to make sure that I make use of the non-productive times outside of the machine," says Günter Redhammer. This is possible with the combination of the zero position chucking system and positioning table. "As soon as the pallet is chucked, we slowly move the workpiece on one side and then the other and finally align the FIBRO rotary table precisely with the workpiece. And now we can already start milling."

Since FILL has already had very good experience with FIBRO swing bridges and rotary tables in its SYNCROMILL processing centres and travelling column machines, it decided on the rotary table specialist from Weinberg once more for the equipping of PowerBridge. "I have to rely on the rotary table remaining in operation for 10 to 15 years. That is the case with FIBRO," emphasises Redhammer.

In comparison with rotary tables with a hydrostatic bearing, Günter Redhammer finds the roller-bearing-supported FIBROMAX to be excellent. In addition to the comparatively low investment, the heavy-weight table persuades with low running costs. "The efficient rotary table has lifetime lubrication and requires practically no maintenance effort." Only a small oil container for the clamping must be checked twice a year. "With FIBROMAX, there are no real maintenance, no downtimes, and no disposal costs for the oil and filters. Despite the asymmetrical chucking, we achieve precisions that lie well above the required values." The manufacturing profession had consciously somewhat oversized the rotary table in order to exclude wobbling completely in case of an eccentric load. According to test reports, FIBROMAX SLR.17 (ø 3,000 mm), design for a transport load of 60 t, has a radial precision and evenness of 0,005 mm, whilst the parts precision lies at +/- 1.7". "We are able to achieve the high precision required for our work using a rotary table without a hydrostatic bearing," emphasises Redhammer. "I thus achieve the required quality very closely and have a considerable difference in regard to price."

## **Economic large component manufacturing**

With their high rigidity and optimum flow of force, FIBROMAX NC rotary tables are especially designed for the flexible positioning of heavy loads. The latest version, FIBROMAX 2.0, is available in four sizes with diameters of 1,250, 1,800, 2,500 and 3,200 mm for transport loads of 25, 50, 100 and 400 t. A large, maintenance-free roller bearing takes up both radial and axial forces in the case of the XXL rotary tables. When in a positioned state, hydraulic table top clamping also increases the tangential torque and relieves the gearing. In contrast to rotary tables with hydrostatic bearings where the table top is raised with each cycle, the price/performance-optimised FIBROMAX 2.0 requires no hydraulic

power pack and no cooling. Instead, the roller bearing reliably takes up axial forces reliably without the risk of thermal distortion. In case the power suddenly fails, the bearing function is not affected. Together with the play-free twin drive, the rotary tables also allow circular milling and simultaneous machining.

## **Precision, efficiency, and short delivery times**

For good reasons, FILL decided to implement a new machine concept: On the one hand, geometrical deviations occurred again and again during the processing of base frames on travelling column machines. On the other, manufacturing efficiency was to be increased. And ultimately, the company wanted to free itself from the somewhat overlong delivery times when large components had to be manufactured externally. "We usually have a four to six week period from drawing to manufacturing. This is not possible on the free market in the case of large components. We thus had to find our own solution and become independent," FILL Managing Director Wolfgang Rathner says. "Nowadays, it is not necessarily the cheapest company that gets the order, but more often the fastest."

FILL did not find much in regard to large gantry milling machines on the market, according to Rathner. Machines with hydrostatic bearings have the right precision, but are often unjustifiable in cost accounting. In turn, more affordable machines often have deficits in precision and flexibility. The decisive question was: Why couldn't FILL build the machine itself? "We already build small gantry milling machines, like our FILL SYNCROMILL. Mechanical and electrical engineering, mechatronics – these are all skills that we have," says Rathner. That SHW had just completed its first concept for a universal XXL gantry milling machine came at just the right time for FILL. Together, they tailored the concept to the special requirements for flexible manufacturing, whilst focusing on high quality and performance, high precision, and an attractive price. SHW took over the centralised components like the bridge, capstan head, milling head, and toothed rack drives of its UniForce travelling column machines and adapted them for PowerBridge. The excellent machining performance, precision, productivity, reliability, and flexibility of the SHW travelling column machines were trans-

ferred to the gantry concept to some extent. The heavy-weight table of FIBRO rounded off the concept.

## **The concept succeeds**

In the opinion of Wolfgang Rathner, the situation worked out: "Today we know that we achieved exactly what we intended. PowerBridge is a machine for heavy-weight machine construction. It allows loads up to 300 t on the plate span and 60 t on the rotary table – mind you, at maximum precision and speed. In our air-conditioned hall, we achieve precisions within the  $\mu$  range and can now offer a product range with short delivery times, which was previously not possible to this extent."

Now that the production and economic efficiency has been proven after all the teething troubles, FILL also sees potential in the marketing of the PowerBridge gantry milling machine, as is typical for the dedicated company. It would not be the first time that FILL has developed a completely new area of business from such a project, especially it has already received several inquiries for PowerBridge. According to Wolfgang Rathner, the machine has potential in spades "there has practically been a vacuum in the area of efficient and, at the same time, precise large parts processing until now."

**Info box:**

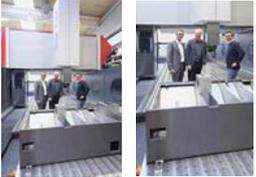
**FILL GESELLSCHAFT M.B.H.**

FILL is an internationally leading machine and plant building company. Its business activities comprise the areas of metal, plastic, and wood processing for the automotive, aeronautical, wind power, sports, and construction industry focused in the three areas of competence: foundry machines, processing machines/profile technology, and plastics/composites. In the case of foundry machines for casting, cooling, decoring, and preprocessing, FILL is amongst the Top 3 in the world. In decoring machines and machines for the production of skis and snowboards, FILL is the world market leader. The family company founded in 1966 is headed up by the two Managing Directors, Andreas Fill and Wolfgang Rathner. It currently has about 640 employees.

[www.fill.co.at](http://www.fill.co.at)

**Captions**

Load 1	PowerBridge comprises two independent machines on a base frame. One works on the rotary table, the other on the long bed.	
Loads 2 + 3	The workpieces are set up outside of the machine during the main production time, chucked on the FIBROMAX rotary table, and precisely aligned within seconds.	

<p>Processing 1 + 2 + 3</p>	<p>In the case of the FIBROMAX heavy-weight rotary table, a large roller bearing guarantees precision that is comparable with that of rotary tables with hydrostatic bearings.</p>	
<p>Meeting 1 + 2</p>	<p>FILL Managing Director Wolfgang Rathner (middle) and Team Lead for Parts Manufacturing Günter Redhammer (right) are pleased with the quality of the FIBRO rotary tables. At the FILL location of Gurten, they explain the potentials of the gantry milling centre to Thorsten Schauder, Head of Business Development at FIBRO.</p>	
<p>FIBROMAX</p>	<p>FIBROMAX heavy-weight positioning tables have a large bearing diameter. According to size, they are designed for transport loads of up to 400 t.</p>	

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