

# Press Report

Application OHL Gutermuth

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SHW has achieved a customised solution through specially programmed routines

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## A round success

**(Altenstadt/Aalen) For complete machining of large control valves, the long-established OHL Gutermuth company recently invested in a mill-turning centre from SHW Werkzeugmaschinen. Thus today, on a UniSpeed 5T in two set-ups and in a shorter time, they can achieve better results than previously with at least four set-ups on two or more machines. In machining the three times eccentric butterfly seats, vital to ensuring the seal of a butterfly valve, the rise in productivity still continues to amaze. This has been achieved through a specially developed SHW application which has transformed a standard machine into a customised solution, capable of turning complex geometry out of centre both rapidly and with great precision. Thus operators of modern solar power stations, among others, can now be sure that the flow of hot thermal oil through their huge distribution networks is reliably metered and controlled.**

"Perfect machining of the three times eccentric valve seats is decisive for the reliable seal of our metallic sealing KX butterfly valves," stresses Sören Rau. "After all, media with pressures up to 150 bar and temperatures of -198 to +850 °C have to be carefully regulated or closed," continued the project leader at OHL Gutermuth. If one takes a closer look at the operating ranges of the control valves, butterfly valves and other products it soon becomes clear why the demands are so high. Besides modern solar power stations in Spain, steelworks, refineries and petrochemical plant have all chosen to rely on the universal, metallic sealing butterfly valves with three times eccentric seat geometry. Extremely hot or cold media can flow equally well through the control and butterfly valves with stellited valve seats as very aggressive or abrasive media. Here it is important to keep the high pressures and large pressure changes reliably under control. During machining of the housings, KX butterfly valves and in particular the valve seats, besides highest precision and dependability, above all process reliability on the machining centre concerned is of utmost importance.

### One versatile, universal head

Around 650 kg is what the butterfly valve castings made of ASME-Code, PED-conform cast steel weight on the work table of the machining centre. Depending on the design drawing, machining allowances up to 15 mm have to be removed and the required geometric elements such as holes and threads produced. Since July 2011, the valve specialists at OHL Gutermuth have been focusing all their attention on the UniSpeed 5T mill-turning centre from the Swabian manufacturer SHW Werkzeugmaschinen. Workpieces up to six tonnes in weight can be turned and milled in one set-up on the entry-level machine

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from the company in Aalen. With axis lengths of X = 2000 mm, Y = 1300 mm and Z = 1300 mm, the size of the valve bodies is no problem. "Previously we needed at least four set-ups on two machines to achieve the same result," recalls Sören Rau. After the turning operations on a vertical boring and turning mill, the rest of the machining was carried out on a horizontal boring machine with a controlled facing slide. Changing from one machine to another and re-clamping increases the throughput time as well as creating sources of error which add to the amount of reworking.

Today the SHW machining centre performs the task much faster. "We have been able to reduce the main machining time by at least 30 percent and completely save the non-productive time of two machine changeovers," says Sören Rau. Besides the inherent rigidity of the machine frame constructed as a portal from high-grade composite material, what is responsible for this, above all, is the compact and powerful orthogonal head of the machining centre. "With this we can achieve fast and precise positioning at every point on the workpiece," explains Christian Schultheis. The young employee at OHL Gutermuth has been familiar with the UniSpeed 5T from the start. Theoretically the machining head can reach 64,800 positions resulting from the 180° swivel range of the A-axis and 360° of the C-axis. Because the head is very compact it can swivel to any desired position automatically without restricting the work area.

### **Sequence machining of different angles**

And yet: the many possibilities offered by the standard machine were still not sufficient to machine the three times eccentric geometry of the valve seat. Bernd Martiné from SHW recalls the initial discussions. "Here flexibility and travel distances were called for which we first had to program in appropriate cycles." Turning the various angles in the valve seat of 2 degrees on the one side and up to 22 degrees on the opposite side called for complex calculations. After all, it is precisely here in this area that the pressure tightness of the flow-optimised control and butterfly valve is decided. There is no alternative to metallic seals for these media, these temperatures and these pressure variations. While rubber seals cannot withstand the pressure, laminated seals are squeezed out and PTFE materials disintegrate, only metallic seals can be used. And only the complex geometry ensures absolute pressure tightness. Not only does the valve flap have to seal tightly, it must also do this without friction. Similarly, when opening, the medium is not allowed to spurt out but, depending on the design of the various angles, it must flow through the flap at exactly the right rate. "That these precise operations can today be carried out with such a high degree of process reliability and repeatability is thanks to the dedication of our designers and programmers," stresses Anton Müller, Managing Director of SHW Werkzeugmaschinen GmbH.

The optimised control of the SHW machine provides an ideal solution to the specific requirements. Off-centre turning does not just produce precise geometry. Since the very rigid machine performs the turning and milling operations extremely smoothly, it also ensures an excellent surface finish, thus achieving the required surface finish and quality of RA = 0.8 with ease. "These

values usually lie between 0.4 and 0.8," says Wilhelm Sens, head of design at OHL Gutermuth. Before the company from Hessen finally dispatches its valves, each has to undergo a thorough inspection.

### **Close cooperation leading to good results**

The necessary tools for all turning, milling and drilling operations are delivered to the milling head by the tool changer using a double gripper and then tightened in place with 130 kN. For certain milling operations, extra-long and particularly rigid tools or tools with Hirth serrations are used. "Here I would like to mention the role of our tool supplier RAZ in Dietzenbach," Rau interjects. "Sales manager André Petrovic and his technicians helped us particularly in the initial stages with their flexibility and great ideas to try the right tools. With just a formal approach and fixed working hours we would never have found the best solution so quickly," says the project leader, giving credit to the tool supplier. In general the good and close cooperation between all concerned was the key to success. "At SHW there was always someone available for us to talk to and after a short time we usually had an answer to our questions," stressed Sören Rau. Bernd Martiné was quick to return the compliment stating, "The fact that the requirements were clearly and precisely defined from the start made finding the solution very much easier."

999Wörter, 7.610 Zeichen

Bei Abdruck bitte zwei Belegexemplare an SUXES

### **((FirmeninfoSHW Werkzeugmaschinen))**

#### **A young company with a long tradition**

SHW Werkzeugmaschinen GmbH is one of the leading manufacturers of machine tools for machining large components in the world. On the SHW machining centres with their long axes, components are machined for mechanical engineering, die-making and plant construction, turbine and tooling manufacture, as well as for the aerospace industry, where despite enormous size components still require a high degree of precision.

What started in 1999 as a young, innovative company in Aalen-Wasseraffingen, on closer inspection turns out to be a company with a long industrial tradition going back to 1365. Steady growth and loyalty to its Swabian roots have led to the 200 highly qualified, quality conscious employees achieving an annual turnover of 60 million Euros. Presence in 45 countries ensures proximity to customers worldwide.

### **((FirmeninfoOHL Gutermuth))**

#### **Expertise with tradition and certificates to prove it**

OHL Gutermuth Industrial Valves GmbH is one of the leading manufacturers of industrial valves for the chemical and petro-chemical industries, energy suppliers, as well as for the plant manufacturing and shipbuilding industries. Started in 1867, it has grown to become a dependable partner wherever valves are required to regulate and close off the flow of fluids ensuring a particularly high level of safety and where ideal solutions are called for. Numerous certificates guarantee approval of the products in the most demanding of applications such as, for example, in Gazprom pipelines. The expertise of the 125 employees throughout the world is the result of combining experience in plant manufacture with extensive know-how in materials and processes technology. Together with highly sophisticated manufacturing technologies this forms the basis of

the expertise of the company, which since 1992 has been based in Altenstadt near Frankfurt-am-Main.

## Bilderverzeichnis / Picture gallery

### SHW Werkzeugmaschinen:Application OHL Gutermuth, Altenstadt

With 2 clicks to the picture under [www.pressearbeit.org](http://www.pressearbeit.org)



Bild Nr. 01-01 SH\_OG-Rohling.jpg  
Around 650 kg is what the grey cast iron casting of the butterfly valve weighs on the work table of the machining centre.



Bild Nr. 01-02 SH\_OG-UniSpeed5T.jpg  
Mill-turning centre UniSpeed 5T from SHW Werkzeugmaschinen with axial lengths of X = 2000 mm, Y = 1300 mm and Z = 1300 mm for machining workpieces weighing up to 6t.



Bild Nr. 01-03 SH\_OG-Fraesen.jpg  
With the SHW machine, the main machining times have been reduced by over 30 percent.



Bild Nr. 01-04 SH\_OG-Position.jpg  
The compact and powerful orthogonal head can reach 64,800 individual positions.



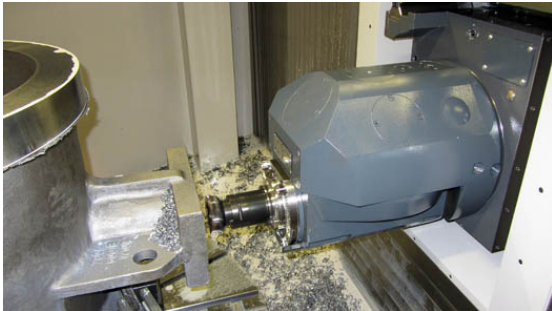


Bild Nr. 01-05 SH\_OG-Fraesen2.jpg  
Carrying out as many operations as possible in one set up increases precision.



Bild Nr. 01-06 SH\_OG-Bohren.jpg  
Butterfly and control valves for demanding applications are produced at OHL Gutermuth with the greatest possible accuracy and quality.

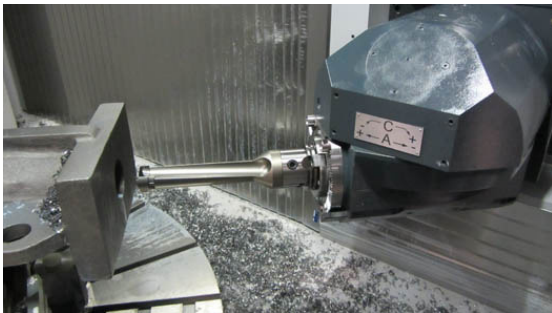


Bild Nr. 01-07SH\_OG-Bohren2.jpg  
Since the orthogonal head of the UniSpeed 5T is very compact, it can swivel automatically to any desired position without restricting the work area.

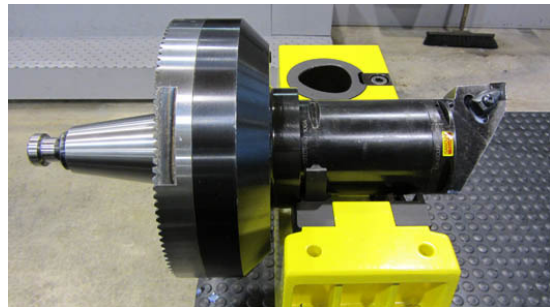


Bild Nr. 01-08 SH\_OG-WzgHirth.jpg  
Where the demands on stability are particularly high, a tool holder with Hirth serrations can be used.

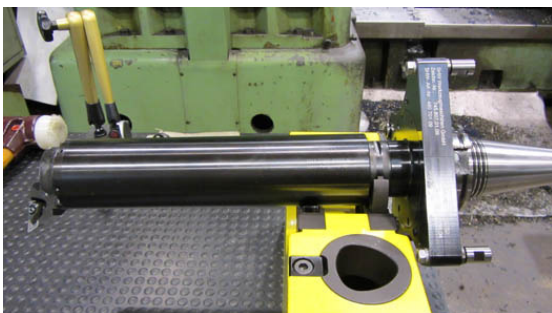


Bild Nr. 01-09 SH\_OG-WzgLang.jpg  
For some turning operations vibration dampened "silent tools" from Sandvik are used. These are delivered with the supporting SHW tool holder directly from the tool changer.



Bild Nr. 01-10 SH\_OG-RauSchultheis.jpg  
A specially developed programming routine machines the different angles in the valve seat from 2 degrees to 22 degrees with the desired result -thanks to close cooperation!  
(Christian Schultheis, left, Project leader Sören Rau, right, both from OHL Gutermuth).

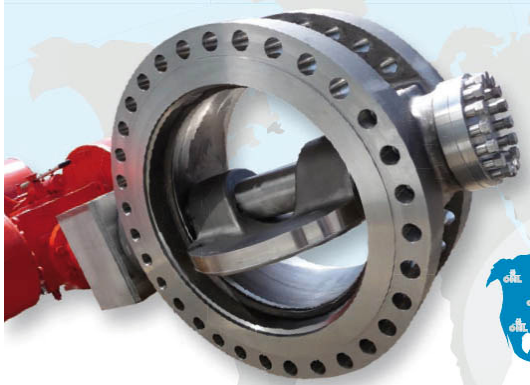


Bild Nr. 01-11 SH\_OG-Absperrklappe.jpg  
 Butterfly valves from OHL Gutermuth control and close-off the medium flow at pressures up to 150 bar and temperatures from -198°C to +850°C.



Bild Nr. 01-12 SH\_OG-Klappensitz.jpg  
 For reliable pressure tightness of metallic sealing KX Butterfly valves, precise machining of the three times eccentric valve seats is vital.



Bild Nr. 01-13SH\_OG-Fertigung.jpg  
 OHL Gutermuth Industrial Valves GmbH is one of the leading manufacturers of industrial valves for the chemical and petro-chemical industries, energy suppliers, as well as for plant manufacturing and the ship building industry.