

Herkules – world leader in roll machining for aluminum manufacturers

Topics:

Aluminum special:

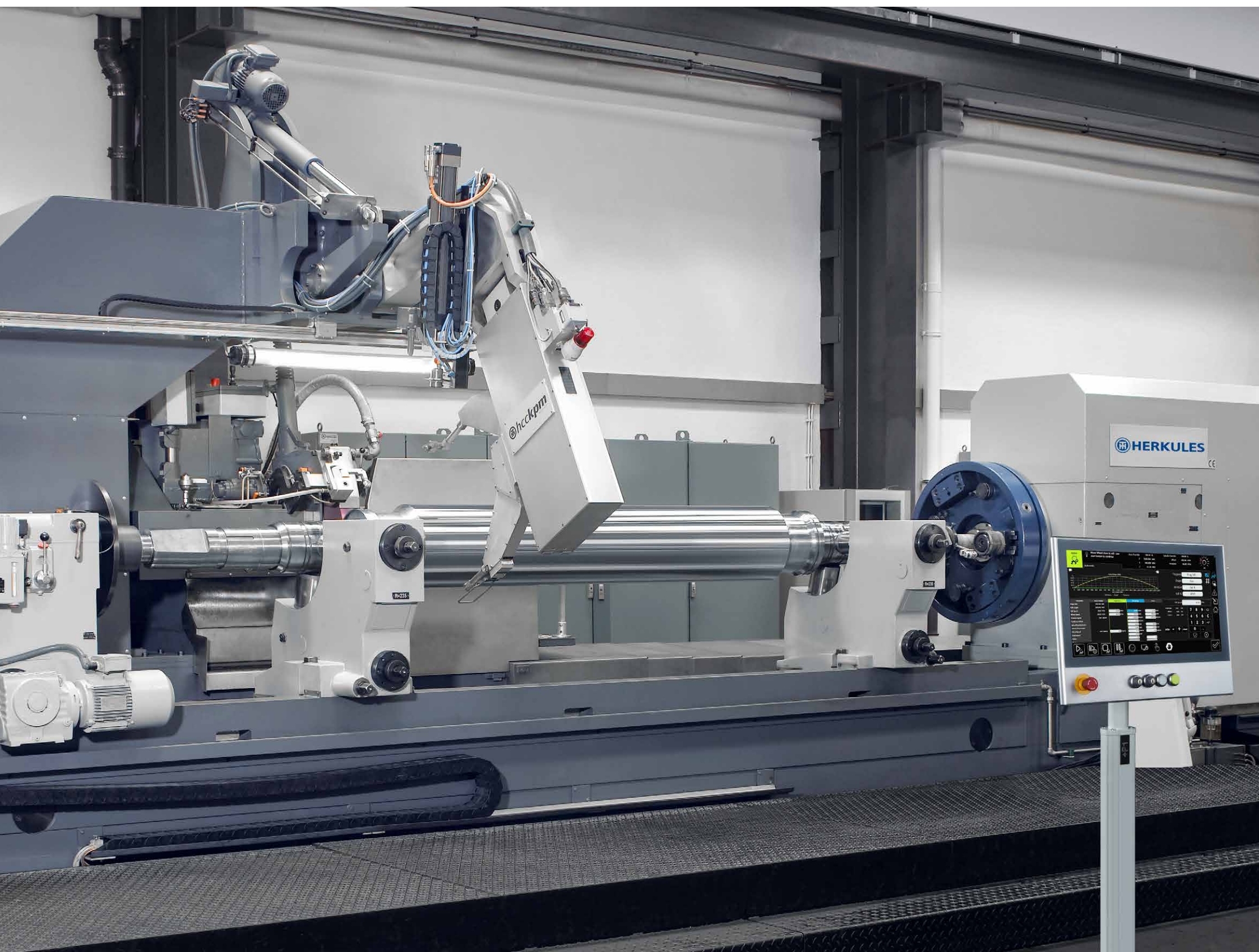
Interview with Sales President
Jörg Naumann

Record installation

Follow-up order by Aisha Steel
Mills Limited

Major order

Herkules supplies complete roll
shop for hot rolling mill in Mexico



Maximum output in the rolling mill with perfectly ground rolls

Interview with Jörg Naumann, Sales President of Herkules

From spacecraft components to electric cars, aluminum plays a major role as a material for technologies of the future. For aluminum manufacturers worldwide, Herkules is the first choice when it comes to the machining of their rolls in the roll shops. We spoke to Jörg Naumann, Sales President of Herkules, about the ideal strip flow and the significance of roll material removal in the μ range for considerable savings in the production area.

HerkulesNews: Herkules is the world leader in roll machining for the aluminum industry. What are the deciding factors that keep convincing customers of the superiority of Herkules technology again and again?

Jörg Naumann: The quality standards for roll surfaces in the aluminum industry are higher than anywhere else. We have to deliver the solutions that are required here. The strip flow in the rolling mill depends on the homogeneity of the work roll surfaces to a large degree. If a roll is not ground to perfection, the force distribution in the rolling mill is unbalanced, which leads to buckles and waviness on the strip. The more homogeneous the roll, the more even the force distribution and the strip flow. If the latter is absolutely regular, the speed in the rolling mill can be increased, resulting in higher productivity while maintaining excellent quality. Perfectly ground rolls are a deciding factor for the output of a rolling mill.

“90% of all rolls in the manufacture of foils worldwide are ground on Herkules roll grinding machines”

Jörg Naumann (Sales President of Herkules)



HCC/KPM measuring and control technology: C-frame caliper for precise roll measuring

The combination of stable, vibration-damping roll grinders and our specifically developed measuring and control technology ensures the highest surface quality. This is why most customers decide in favor of Herkules.

Current projects

The South African Tesla supplier **Hulamin** recently made headlines with a unique fitting for satellite dishes that enable wifi connections on airplanes. Instead of an electric overhaul of existing Herkules machines in the facility as initially planned, the company decided to invest in a new WS 450 AL Monolith™. By installing a new machine, Hulamin avoids production downtime during the renovation period. Thanks to the Monolith™ bed, the machine does not require a foundation – eliminating the foundation works that would disrupt the ongoing production in the roll shop. The roll grinder will be installed at a provisional location and later relocated with minimal effort.

There are different concepts that aim to damp vibrations in the grinding process, usually with the help of an elaborate foundation. What differentiates Herkules from other manufacturers?

We have been using the patented Monolith™ technology since 2001. Our machines do not require a foundation. Instead, the vibrations are absorbed by the machine bed, which is built in sandwich design with special high-performance mineral concrete. The damping properties are demonstrably better, not only concerning external vibrations, but also those that are created by the grinding process itself. Direct comparative measurements of a classic roll grinder and a roll grinder with a Monolith™ machine bed have shown that the stiffness of the latter is twice as high. The factor is as high as 5 regarding the dynamic stiffness. Since the introduction of the Monolith™ machine bed, Herkules has sold 81 roll grinders with this technology in the aluminum industry alone, and 237 machines in all sectors. Monolith™ beds are now the established standard solution in the market.

Achenbach Buschhütten, the world-leading manufacturer of rolling mills for the production of aluminum foil, is building a new mill for **Shenlong Baoding New Materials Co., Ltd.** for the fabrication of medical packaging in Shangqiu City. Again, the investors place their trust in two top-class Herkules roll grinders of the type WS 250 Monolith™ in the roll shop – only with these the extremely high requirements regarding the homogeneity of the roll surfaces and the geometrical accuracies that are needed for the highest rolling speeds of more than 2,000 m/min can be met.

This solution had 17 years to prove itself. What are the current challenges you are working on at the moment?

Our sister company HCC/KPM develops measuring and control technology specifically for roll machining. We generate significant advantages for our customers from that – efficiency, machining speed and machining quality are considerably raised. An example: the C-frame caliper aligns the roll with the utmost precision before the grinding process is initiated, reducing the removal of roll material to an absolute minimum. In aluminum foil mills, the removal is reduced to a third when compared to competitors – the customer therefore saves two thirds of the rolls that need to be kept in stock per year!

For India-based **Jupiter Laminators**, Achenbach Buschhütten is also building a new aluminum foil rolling mill and again chooses a **Herkules WS 450 S Monolith™**. The proven cooperation of the business partners guarantees the best results for the packaging specialist.

The C-frame caliper also monitors the roll geometry during grinding. In combination with the KP 10 control, it corrects the machining process “on the fly”, that is during the grinding operation. Our complementing measuring and control technologies that have been developed specifically for grinding applications are absolutely unique in the market.

In **ASSAN Alüminyum**’s facility in Tuzla, Istanbul, a **WS 250 Monolith™** in table-top design has started operation after a short installation period. The length and additional mass of the moved table result in very smooth and precise movement of the workpiece, so that the best surface results are achieved with absolute repeatability in fully automatic mode even on demanding Achenbach work rolls.

What is the importance of Total Cost of Ownership when investing in roll machining equipment?

Most customers decide in favor of **Herkules** for a very good reason: because of the convincing quality of our machines. Yet this is not and end in itself – our customers must stay competitive. We can make an important contribution to that goal. What counts here is not only the cost that is directly related to the operation of the roll grinding machine. If you consider the larger picture, the potentially higher productivity in the rolling mill and the higher quality of the end product, **Herkules** offers the deciding advantages. The surface inspection system **RSIS** for example that we are just installing at our customer **Aluminium Norf**’s facility detects roll defects that are invisible to the human eye and thus prevents unplanned stops in the rolling mill. In the past years, we have collected evidence that proves that the roll consumption can be significantly reduced with **HCC/KPM** measuring, inspection and control technology.

Article continues on the next page ...



The texturing machine PTM 500, a new development by **Herkules** for absolutely homogeneous roll surfaces

Kamensk Uralsky Metallurgical Works (KUMZ) is a manufacturer of aluminum flat products for the aviation industry based in Kamensk-Uralsky. After the successful commissioning of a complete **Herkules** roll shop in 2015, KUMZ ordered a roll grinder of the type **WS 250 Monolith™** this year for the machining of a broad work-piece range including thin leveler rolls with diameters starting from 25 mm, work rolls and rings.



Installed directly on the shop floor without a foundation: roll grinder **WS 450 AL** with a **Monolith™** bed

Continued: Interview with Jörg Naumann

With these advantages, we continue to rely on our technology leadership – 48 machines in aluminum foil mills, the most demanding area of application there is, speak for themselves.

Thank you for the interview!



Jörg Naumann has decades of both technical and sales experience in leading positions in the manufacture of special-purpose machines. He is Sales President of Herkules since 2001.

Hydro is a world-leading producer of aluminum foil. **Hydro Aluminium Rolled Products** in Grevenbroich, Germany has placed its trust in Herkules for many years – five Herkules machines are already in operation there. One more has been installed in the Hydro facility in Holmestrand, Norway.

Aluminium Norf GmbH, owned 50% by Hydro, is the world’s largest aluminum mill and also a loyal Herkules customer with seven machines. The company is continuously investing particularly in the areas of control and measuring technology made by HCC/KPM in order to work on the highest level of quality with a modern machine inventory. Herkules is currently upgrading a roll grinding machine: the WS 600 is equipped with a Roll Surface Inspection System (RSIS) for automatic detection of surface defects.

Service

Record installation with follow-up order



WS 450 Monolith™ with C-frame caliper for grinding of complex CVC curves

This installation went much faster than expected: Herkules engineers Li Ping und Fan Quinling installed and commissioned a roll grinder of the type WS 450 Monolith™ at Aisha Steel Mills Limited (ASML) within two weeks. The rolls required for commissioning were ground to the customer’s full satisfaction – the first rolls could be machined after one week only.

The roll grinder will machine back-up and work rolls. It takes a reliable machine to grind the complex CVC curves in particular. In order to set the parameters in the roll shop based on the curve data, ASML also invested in high-precision measuring technology and installed a C-frame caliper made by HCC/KPM.

The first-class machining results and the record installation left a lasting impression with the customer: “Herkules has changed our perception of a roll grinding machine. It is a precision grinder that performs superbly at fairly high speeds. We were able to achieve the required SPCO curves in the very first attempt,” reports Director & CEO Dr. Munir Ahmed. But ASML did not leave it at praising words: based on the positive results, they decided to invest in another WS 450 S Monolith™.

Ralf Klews

Quality management

Ultrasonic inspection system for thyssenkrupp Hohenlimburg

For the second time, Herkules upgrades a Herkules roll grinder for its long-standing customer thyssenkrupp Hohenlimburg with specially developed quality management technology. In the fourth quarter of 2018, the WS 450 Monolith™ is going to be equipped with an ultrasonic crack inspection device that reliably detects faults under the roll surface before the roll is put into operation in the rolling mill.

The customized design of the system with a five-sensor head was determined in close cooperation with the customer’s project team. Material faults within the roll, caused during the manufacture of the roll or as a result of the operation in the rolling mill, can be detected in detail with the Herkules ultrasound inspection.

In addition, the system allows for the detection of cracks at the surface of the roll with the help of creeping wave technology. This technology is particularly useful when high-alloyed roll material is used, as is the case at thyssenkrupp Hohenlimburg. The ultrasound measurement, the display and the documentation of the measuring results are fully integrated in the ultrafast KP 10 control developed by our sister company HCC/KPM.

Tobias Wurm

VOL-Stahl Group of Companies invests in fifth P 300

Four Herkules lathes are operated in the Russian steel mill Omutninsk Metallurgical Plant that is connected the VOL-Stahl Group of Companies. Now the rolling mill VOL-Stahl France SAS, the leading producer of tool steels in France, has also ordered a lathe of the type P 300.

The section mill VOL-Stahl France SAS is located in the idyllic setting of the river Tarn valley in southern France. Here, the fifth turning lathe for the group of companies will be commissioned in spring 2019. It will machine section rolls with a maximum distance of 3.500 mm between the centers and a turning diameter of up to 700 mm.

The Herkules P 300 series is characterized by its high cutting capacity with an excellent surface roughness of Ra 0.8 µm. The main bearings at the headstock and the tailstock are over-dimensioned and guarantee a long service life at consistently high machining precision. All components of the P 300 have been designed for utmost stability. This results in maximum stiffness of the machine, which is a precondition for chatter-free high-performance turning. In the past years, the VOL-Stahl Group of Companies has benefited from these advantages and therefore decided to trust in Herkules turning technology once again.

Matthias Roth



Maximum stiffness for chatter-free high-performance turning: the P 300 by Herkules

P 800 Power – turning lathe for XXL machining tasks

In the roll shop of the new Masteel section mill in China, two Herkules lathes are going to machine rolls for the production of heavy and super heavy steel beams and sheet piles. The huge section rolls demand an extremely stiff and stable machine design. Herkules has the perfect solution for these XXL requirements: the P 800 Power.

The Power version of the P-series has been developed to secure maximum stiffness and achieve excellent surface qualities at a high cutting performance. With a distance of 7 m between the centers, a maximum turning diameter of 1,650 mm and a weight of up to 50 t, the supplied P 800 Power cover the entire roll range in the new plant.

The two lathes made by Herkules, the world-leading manufacturer of roll machining equipment, will start operation in Spring 2019.

Matthias Roth



P 800 Power for precise machining of huge section rolls

Investments in our own facilities



Highly precise measuring of a cooler housing for sister company RSGetriebe



The welding robot speeds up and optimizes welding at Meuselwitz



The new gas cutting machine raises the efficiency and saves operating costs

Herkules invests in modern coordinate measuring machine

Herkules does not only manufacture world-leading roll machining equipment, it is also a system and parts supplier for other companies in the HerkulesGroup. All machines and components that leave the production facility have to meet high quality standards, often even tolerances in the μ range. Since the beginning of this year, a 3D portal measuring machine is in operation to ensure that the required standards are met in a fast and secure way.

A permanent temperature of 21°C is maintained in the fully air-conditioned room in the production facility in Siegen, Germany where the 3D portal measuring machine performs its tasks in absolute silence since January 2018. The machine measures complex workpieces, such as cooler housings for the sister company RSGetriebe, or pivot bearings for portal milling machines and vertical turning lathes that are also manufactured in the group. When the machines are finished, the machining units pivot in these bearings when machining workpieces – the tolerances are in the μ range. The measuring probe is run along the workpieces and compares the measured values of the form and layer tolerances with pre-defined nominal values.

Another application is the measurement of high-precision parts as an intermediate step to enhance the efficiency during machining. A workpiece is prepared and then measured with a remaining finishing allowance in order to perform the finish-machining based on the documented measuring data afterwards. After six months of operation, the investment has already paid off: quality and delivery reliability are guaranteed.

New welding robot for Herkules Meuselwitz

Herkules Meuselwitz is the welding center of the HerkulesGroup. Different welding applications, such as metal active gas welding and gas tungsten arc welding, are performed here according to DIN EN 1090-3 on the highest level of technology. Now Herkules Meuselwitz has invested again – a welding robot made by Cloos speeds up the production since July 2018.

The six-axis robot machines components up to a size of 10×3 m and a weight of up to 20 t. It multiplies the machining speed and guarantees the welding quality. A ram for an UnionChemnitz boring mill for example requires a minimum of 45 hours manual work for the external seams. It takes the welding robot five hours to perform this task. “The quality of the work is very high, the weld seams are absolutely identical,” reports Head of Production Björn Benjamin Klein. “Thanks to this investment, we are expecting a significant increase in efficiency in the area of welding.”

Gas cutting machine with new building at Meuselwitz

Machine beds for Herkules machines or columns for UnionChemnitz boring mills – welded constructions are part of many HerkulesGroup machines. In order to manufacture these more precisely and more efficiently, Herkules Meuselwitz has invested in a gas cutting machine made by ZINSER this year.

The machine is located in an area specifically built for this purpose and is equipped with a plasma cutting unit. With that unit it cuts sheets with a thickness of 40 mm four times faster than it has been possible before with the help of autogenous cutting. The latter is now used exclusively for cutting sheets with a thickness of 45 – 200 mm. In addition to a significant increase in efficiency in the manufacture of welded constructions, the machine also allows for more economical and more environmentally-friendly cutting using propane rather than acetylene.

Major order: Herkules delivers complete roll shop for Mexican rolling mill

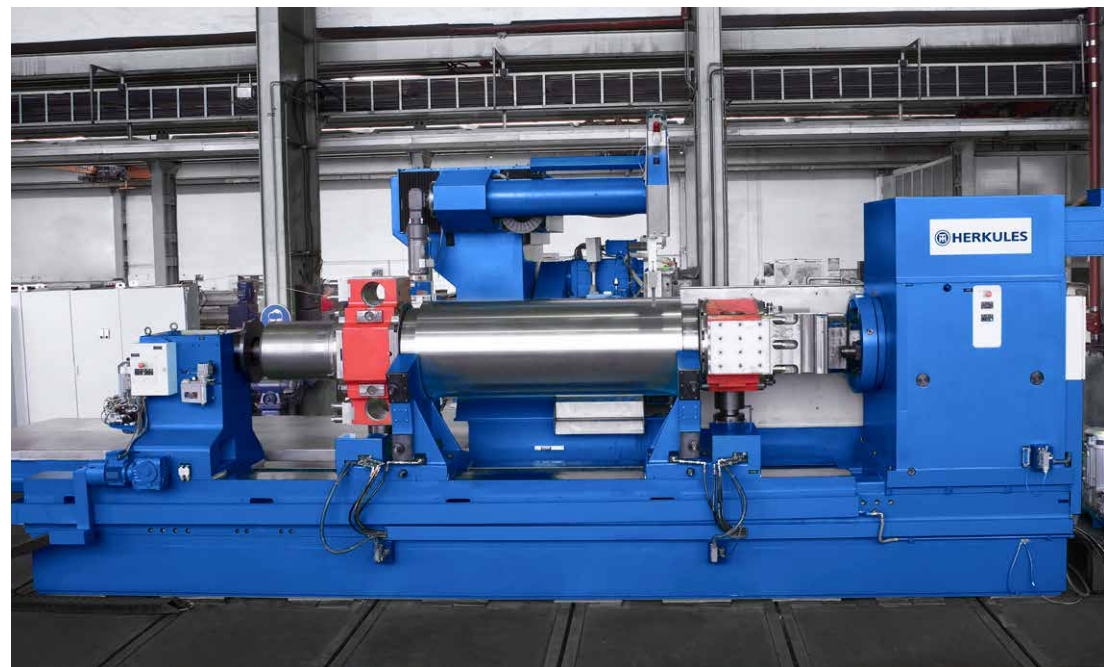
Herkules will deliver an entire roll shop including equipment for a new hot rolling and skin pass mill in Mexico. The scope of delivery includes four roll grinders, the Roll Shop Management System RSMS and comprehensive equipment for roll storage, machining, assembly, and transport. "Receiving this order is a clear signal that quality prevails in the end even in a highly competitive market environment," says Christoph Thoma, CEO of Herkules.

With this new plant to be installed by Primetals Technologies, ArcelorMittal México expands its production site at Ciudad Lázaro Cárdenas. The hot rolling mill – consisting of a roughing mill and a seven-stand finishing mill – will produce 2.5 million tons of hot strip per year; the skin pass mill is designed for an annual capacity of 650,000 tons.

Three roll grinders of the type WS 450 W Monolith™ for the machining of work rolls of the finishing and skin pass mill and a WS 600 Monolith™ for all rolls in the hot rolling mill will form the key components of the new roll shop.

The highlight of the machines: the unique combination of Monolith™ technology with ultra-fast control and measuring systems specifically developed for grinding applications. Both the rolling mill manufacturer Primetals Technologies and the steel producer ArcelorMittal will benefit from the excellent damping characteristics, thermostability, the reduction of foundation costs and correction grinding on the fly.

In addition to the four roll grinders, Herkules also provides the equipment required for fast and secure flow of the rolls and chocks in the roll shop. This includes roll



The key components of the roll shop: Herkules roll grinders

transfer cars, de-chockers for chocks of work and back-up rolls, a chock tilter, roll cooling stands and racks.

The decision fell on Herkules due to the convincing quality and technology of its products. The manufacturing and supply of all components including automation have been laid into experienced hands in order to meet the high requirements in the roll shop.

Tobias Wurm

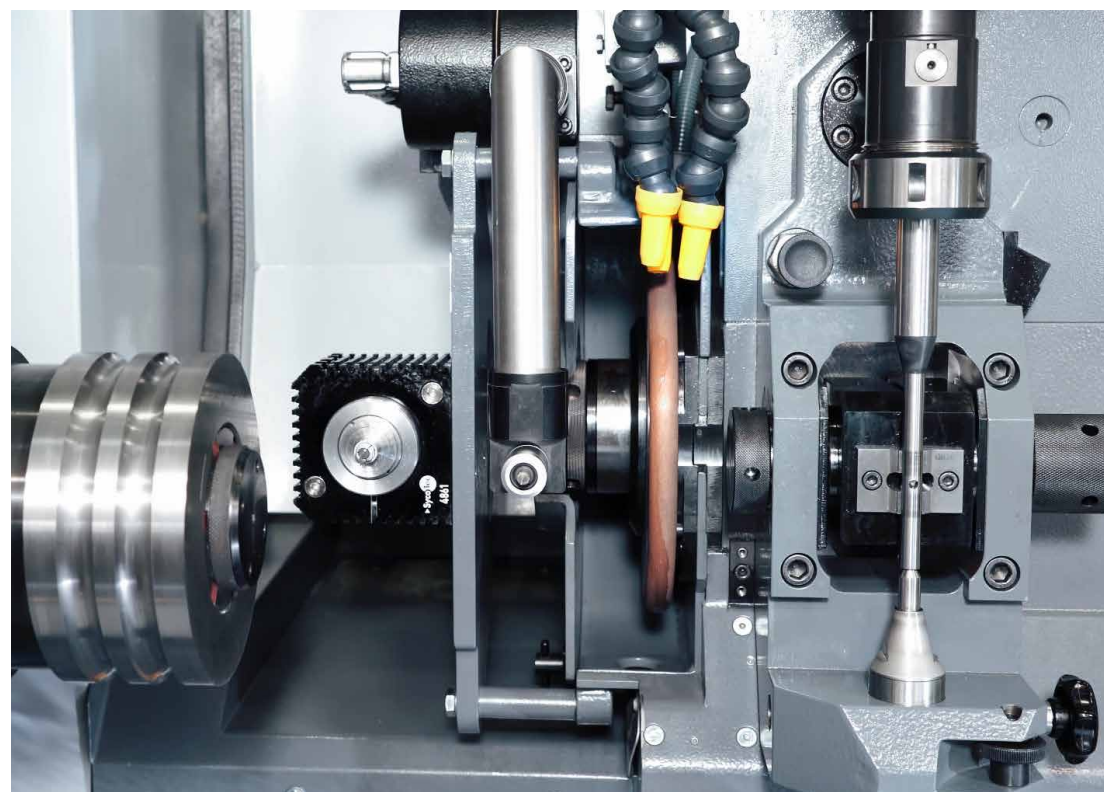
Notch milling and groove grinding machines for the Italian market

O.M.O. SPA is specialized in the regrind of Tungsten Carbide rings and notch milling of rolls used in the manufacture of long products. In May 2018, Herkules successfully installed a notch milling machine NNF with a machine bed based on Monolith™ technology at the company's headquarters in Odolo, Italy.

The NNF is equipped with an automatic measuring device and a logo milling unit. In addition to increased efficiency, these ensure a constant quality output independent of the operator's skill. The machine bed is based on the patented Herkules™ technology and offers high rigidity and an excellent damping effect on the vibrations generated during the notch milling of high-resistance Tungsten Carbide rings and composite rolls.

Two more companies based in the Province of Brescia in northern Italy have also invested in Herkules equipment in the past year: O.To.Ci. (S.R.L.) and COMECA TECNOLOGIE S.p.A. both acquired a combined groove grinder and notch milling machine HSF 3 LT.

Guido Matarazzo



Combined groove grinding and notch milling machine HSF 3 LT

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