

Grinding heavy-duty rolls on foundation-free machines

Topics:

Herkules: the number one choice for the aluminum industry
Perfect surfaces for demanding rolls

Herkules MACHtechnology:
How to save more than 50% machining time with CBN grinding

3D pads for hydrostatic steady rests
100 steady rest pads produced with the 3D printer



Monolith™ technology for heavy-duty grinding

Dear partners, dear readers,

The market for heavy-duty machine tools still has not recovered; it is extremely price-driven and even superior products do not achieve appropriate market prices. Despite this difficult market situation around the globe, Herkules has good reason to look to the future with confidence: investments and structural and technological optimizations during the past years have strengthened us as a company and as a group. We have further developed our products and we can offer our customers an even broader range of technological solutions today.

Herkules has recently received the 200th order for a Monolith™ machine by Shandong Yuanrui Metal Material in China – another milestone in the successful history of this unique technology. Since completing the new production building in Meuselwitz, we are able to build machine beds in the patented sandwich design that weigh up to 100 t. Herkules machines with Monolith™ beds are capable of machining the entire roll range – from thin Sendzimir rolls to back-up rolls in chocks.

For more than 50 years now, Herkules has been the leading specialist for machining the heaviest rolls. The largest roll grinder in the world, made by Herkules, machines rolls up to 300 t; a machine of the type WS 1100 recently ground a plate mill roll with a weight of 230 t in chocks with combined hydrostatic-hydrodynamic bearings – that is a world record.

The market potential in the segment of heavy-duty rolls of and around 100 t is far from exhausted: here, too, we are now able to offer foundation-free machines with Monolith™ technology and excellent grinding results. Our Finnish customer Outokumpu has been won over by the advantages this design offers: a roll grinder of the type WS 1100 with a Monolith™ bed has taken up production there a few weeks ago and now grinds back-up rolls in chocks with weights of up to 90 t. With the latest Monolith™ machines, we are able to cover a promising market segment with superior technology and the customer advantages that go along with it – an important competitive advantage in a continuously challenging market situation.

Sincerely,

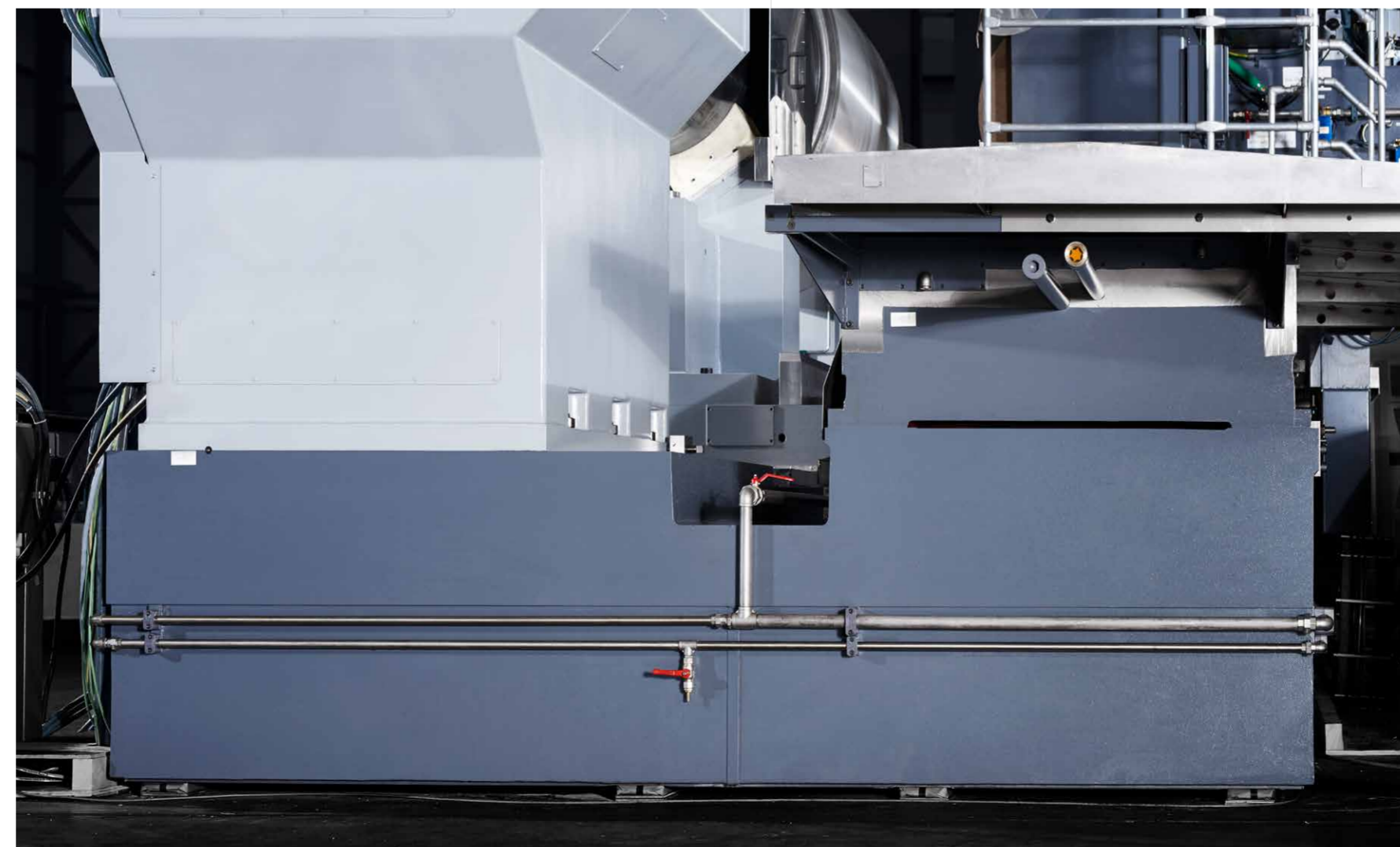
Christoph Thoma

CEO of the companies of the HerkulesGroup

Monolith™ machines for the entire roll spectrum – Perfect grinding results in the XXL range



High stiffness and great damping characteristics provide perfect grinding results



Patented sandwich design: the machine is placed directly on the floor

The history of success of the Monolith™ technology started 16 years ago, but it constantly adds new chapters. Grinding heaviest rolls in chocks is one of the current challenges that can be solved with the foundation-free sandwich design, saving space and investment cost.

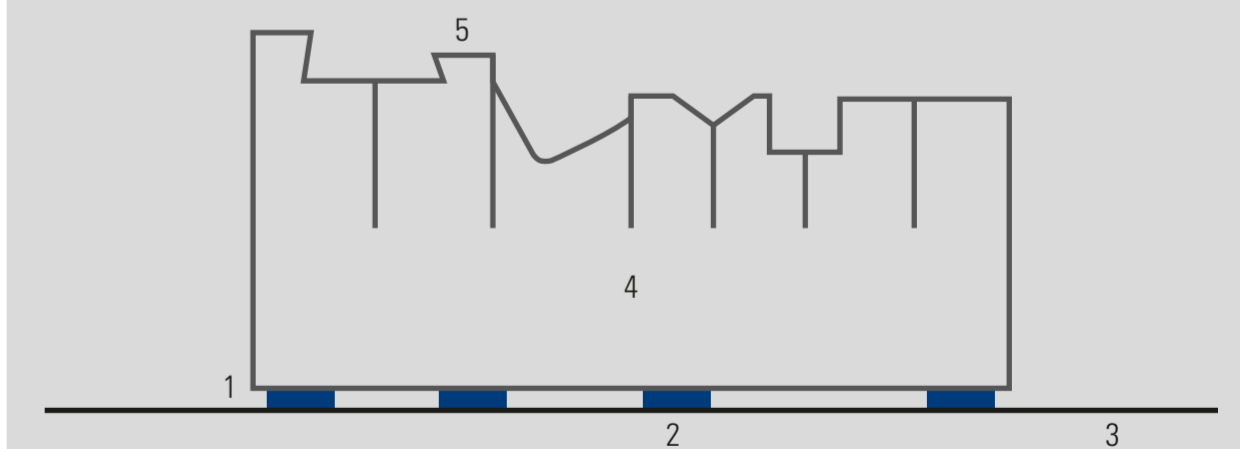
A roll grinder of the type WS 1100 Monolith™ has just taken up operation at Outokumpu Oy. It grinds rolls with mounted chocks with weights of up to 90 t. Before commissioning in Finland, Herkules invited customers to attend its Open House on February 16. Here, the visitors witnessed the machine's advantages during a live demonstration: excellent grinding results thanks to high stiffness and outstanding damping characteristics in a foundation-free design that saves space and money.

Significantly enhanced stiffness in comparison to machines with a classic foundation

The superiority of Monolith™ beds in comparison to conventional machine beds in terms of stability and vibration behavior has been proven by research conducted by the Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University: 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. Moreover, the factor is as high as 5 regarding the dynamic stiffness. These results have been confirmed by decades of on-the-job experience: Monolith™ beds provide better grinding results. More than 200 roll grinders in Monolith™ sandwich design have been sold to customers around the world since 2001 – the anniversary machine recently went to Shandong Yuanrui Metal Material in China. The application area ranges from Sendzimir rolls with diameters of just a few centimeters to heavy plate mill rolls.

[View a product video of the WS 1100 Monolith™ in operation here:](https://herkules-machinetools.com/WS1100)
herkules-machinetools.com/WS1100

Design of a Monolith™ machine bed



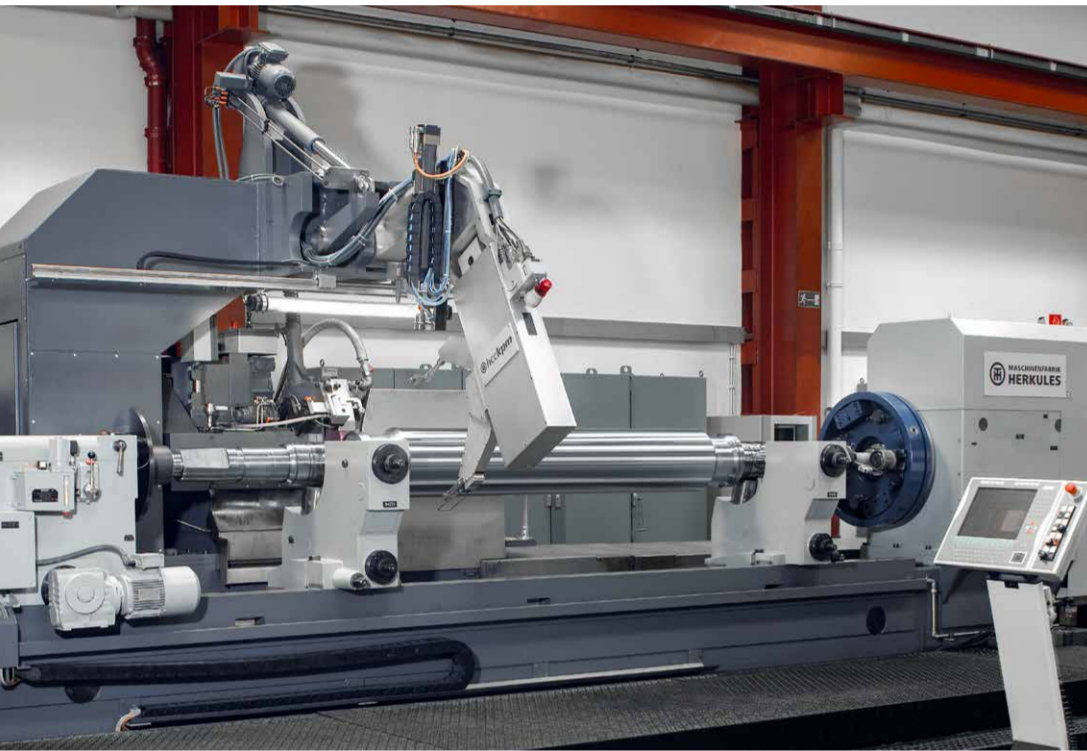
Monolith™ beds are placed directly on the floor (3) on a steel floor plate (1) with special damping elements (2). The next layer is fiber-reinforced high-performance concrete (4) that effectively damps vibrations. The machine bed is completed by a cast-iron, ribbed upper section (5).

The advantages:

- High stiffness
- Excellent damping
- High thermostability
- Easy installation, even in existing roll shops
- No foundation works/cost

Monolith™ technology for demanding rolls: Perfect surfaces for aluminum strip

For decades, Herkules and Achenbach Buschhütten, the global leader in building rolling mills for the production of aluminum foil, have been fostering a successful business partnership. Most of Achenbach's customers trust in roll grinders made by the global market leader Herkules when equipping their roll shops: in order to produce perfect aluminum strip, you need perfectly ground rolls – no other application is this demanding.



Herkules is the first choice for the demanding aluminum industry

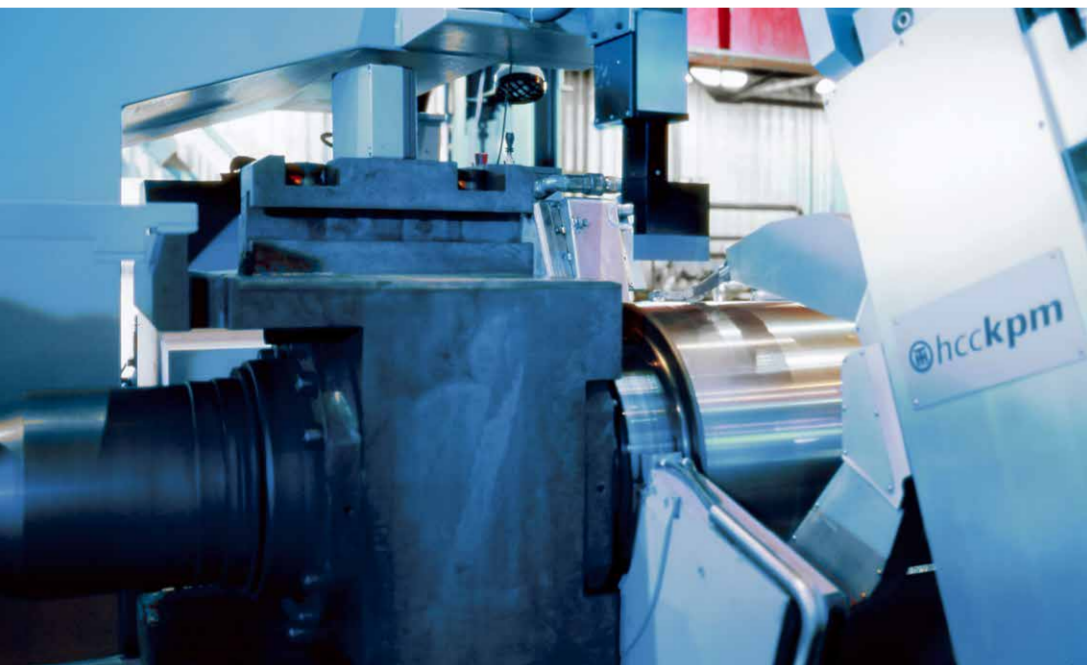
In April 2017, the Indian Raviraj Foils Limited (RFL) decided to invest in a new aluminum rolling mill by Achenbach and ordered a roll grinder of the type WS 450 S × 4500 CNC Monolith™ by Herkules to machine its back-up and work rolls. RFL is a key player in the Indian aluminum industry and supplies its products to the pharma and packaging industries, among others. Since the surface quality of the aluminum strip must meet the highest demands, the work roll grinder in the roll shop, too, must fulfill the highest quality standards regarding geometrical accuracy and machining quality. The foundation-free WS 450 S with a Monolith™ machine bed effortlessly meets these requirements.

The roll grinder is equipped with a HCC/KPM two-point measuring system. The combination of ultra-fast control and measuring systems guarantees first-class grinding results and homogeneous roll surfaces. Thanks to the exact determination of the roll's positioning before the grinding process, stock removal and wheel wear are also minimized.

In addition to perfectly grinding the work rolls, the WS 450 S also ensures that the back-up rolls are machined to high standards. In the production of aluminum foil, this is of major importance, as it is the only way to avoid roll breakage. The machine grinds the barrel end relieves at the back-up roll according to the high demands by Achenbach and thus guarantees smooth and reliable operation of the back-up rolls in the rolling mill.

Ralf Klews

Roll grinders number 8 and 9 for Rizhao Steel



Shorter machining times: Rizhao Steel invests in more Herkules machines

The Chinese Rizhao Steel Holding Group has ordered two roll grinders of the type WS 450 × 6000 CNC Monolith™. The machines will be used in its third ESP plant (Endless Strip Production), in which the company produces hot strip directly from liquid steel. In each of Rizhao Steel's ESP plants, Herkules machines are already in use.

The seven roll grinders that are currently working in Rizhao Steel's roll shops impress with shorter machining times than those of other brands. Perfect positioning of the rolls and reduction of unnecessary stock removal thanks to state-of-the-art measuring and control systems by HCC/KPM add to this advantage – reason enough for Rizhao Steel to invest in more Herkules machines.

Besides efficiently grinding work rolls in chocks, the two Monolith™ machines, like their predecessors, guarantee adherence to tight tolerances and homogeneous roll surfaces in the ESP plants and thus flawless hot strip.

Ralf Klews

Herkules MACHtechnology: saving 50% machining time

Grinding rolls with CBN wheels offers many advantages: higher stock removal in combination with shorter machining times, less wheel wear and the possibility of reliably machining hard-to-machine, highly-alloyed steels. However, successfully grinding rolls with CBN wheels is a challenge even for technology leaders in the field of roll machining.

This is why Herkules founded a cooperation that, being the first supplier of this technology, has been carrying out pioneering work since 2013 – it implements efficient roll grinding with CBN wheels in customer plants with sustainable success. Herkules MACHtechnology is a technology package composed of Herkules machines, customized HCC/KPM control and measuring systems and CBN grinding wheels made by Mach Rotec.

Chrome Deposit Corporation in Columbus, Mississippi, USA now also benefits from this technology. The company is specialized in the machining of roll surfaces for the steel industry. A Herkules roll grinder of the type WS 600 Monolith™, which has only recently been installed there, has just been equipped with Herkules MACHtechnology. During the tests conducted on-site after commissioning, the upgraded machine performed to the customer's full satisfaction – the machining time for grinding CPC rolls was reduced by more than 50%. A stock removal of 0.2 mm is achieved in approximately 80 minutes by conventional machines. Equipped with Herkules MACHtechnology, the WS 600 achieved the same result within 35 minutes. Application Engineer Andreas Adam demonstrated these machining results during the AIST (Association for Iron & Steel Technology) Meeting that took

place in Columbus on January 24 in front of the Hot Sheet Rolling & Rolls Technology Committee members present.

On top of higher cutting rates at shorter machining times, Herkules MACHtechnology also considerably raises the energy efficiency. At the same time, the service life of the rolls is extended significantly thanks to the optimization of the stock removal. These advantages are complemented by better repeatability, enhanced homogeneity over the entire roll surface and simplified control of the grinding process – convincing arguments for the machining (not only) of hard-to-machine rolls.



Herkules MACHtechnology is a pioneer in roll grinding with CBN wheels

Modernization after 35 years of service

Herkules roll grinders work reliably over the course of decades. A combined roll grinder of the type WS 850 × 6500 CNC delivered to the Taiwanese C.S. Aluminium Corporation in 1981 is now being modernized by Herkules for the third time. Afterwards, it will resume its service, which has so far lasted well over 35 years.

In C.S. Aluminium Corporation's aluminum hot and cold rolling mill, the grinder machines work and back-up rolls with a length of up to 6.5 m and a weight of up to 55 t. The first step of the modernization is the replacement of all electrical components, including the main drive and the switchgear cabinet. This ensures absolutely reliable operation of the machine in the future. In order to guarantee consistently high machining accuracy for all rolls, in particular for the demanding work rolls in the cold rolling mill, the guideways are re-scraped and mechanical components are refurbished.

The machine will also receive a control upgrade: it is equipped with the cutting-edge KP 10 control by HCC/KPM. This is a great advantage in terms of flexibility, as it has to machine a broad range of rolls. That includes high stock removal at back-up rolls on the one hand and a high surface quality for cold rolling mill work rolls on the other. The grinder fulfils these tasks efficiently with the help of the KP 10, which has been specifically developed for the complex applications of a roll grinder. The efficiency is further enhanced by the C-probe, which is added to the C-frame

measuring gauge. This reduces the stock removal to a minimum, expanding the rolls' service life. The result of the comprehensive refurbishment and extra equipment: an extended working and measuring area, higher accuracies and increased efficiency – the 35-year-old machine is now fit for more decades of reliable service.

Jens Böhmer



As good as new after 35 years of service: Herkules roll grinders work reliably over the course of decades

100 hydrostatic steady rest pads from the 3D printer



Until recently, customers had to allow for eight to twelve weeks of delivery time for new steady rest pads. In addition, they had to be elaborately changed with the help of a crane. This took around 30 to 45 minutes per set with four pads – a tedious process. In contrast, at Herkules, a 3D printer produces steady rest pads made of plastic that are delivered within three weeks and can be changed up to 70% faster without a crane.

100 pads for hydrostatic steady rests have been manufactured since February 2016. Based on 3D drawings, the 3D printer of the type EOSINT P 760 manufactures high-quality steady rest pads by powder bed fusion method with the help of two high-performance lasers. They are as durable as metal pads.

“It is not just the steady rest pads we produce here with the 3D printer,” says Head of Production Thomas Meyer. “We also manufacture many other components, some of which are very complex and difficult to produce using conventional methods. I see a lot of potential here.”

Time-saver: the steady rest pads produced with the 3D printer can be changed manually

Hydro Aluminium’s story of success continues

Hydro is a world-leading producer of aluminum. The company produces most of the aluminum used in Germany and also takes a top position in terms of quality.



After the success of the first WS 450 AL, Hydro Aluminium ordered a second, identical machine

Hydro has invested more than 600 million Euros in the modernization and expansion of its German locations since 2002, in particular in the special production lines for the automotive and printing industries and the production of aluminum foil in μ range in Grevenbroich. There, the roll shop has been raised to the latest level of technological innovation with two Herkules roll grinders. As the undisputed world market leader in roll grinders for the aluminum industry, Herkules ensures that the rolls at Hydro Aluminium Rolled Products GmbH are put into operation in immaculate condition.

The first new roll grinder took up operation in June 2015 in Grevenbroich. The WS 450 AL has been specially designed for the requirements of the aluminum industry. The inherent stability of the rolls used here is relatively low, since considering their length, they have a relatively small diameter. The WS 450 AL compensates this with its extremely robust design. In addition, the highly accurate C-frame measuring device allows for on-the-fly correction during grinding and thus provides excellent grinding results. Both “go! The Hydro Way” and HerkulesNews reported on the success of the first WS 450 AL in Grevenbroich. At the heart of the new roll shop, it impresses with nearly 100% availability and it grinds rolls up to 50% faster than its predecessor.

Based on the good results of the first machine, the second WS 450 AL took up operation in February 2017. Despite a much shorter delivery time, the structurally identical machine will continue the story of success at Hydro.

Matthias Roth

Production relocated within Asia – service in China expanded

The production site of the HerkulesGroup in Jiaxing/China has been closed in February 2017. One of the reasons, besides strategic considerations, was the difficult production environment there. Nevertheless, customers in Asia can still rely on short delivery times. Production at the HerkulesGroup company Deutsche Maschinen India (DMI) has been and is still being further expanded.

Besides the investment in a new production building in Kolkata, the production capacity is strengthened in terms of personnel, too. In the long term, the sales and service team at this location will also grow.

In China, further investments are made in the spare parts and service business. Some employees are transferred from the former production facility to the spare parts and service company Jiaxing GMT German Machine Tools, which is moving into a new building that is twice as large, with twice the spare parts storage space, in Jiaxing City. More than 50% additional staff are employed at the new location. The strong Chinese market is still of major importance to Herkules – approximately 40% of our machines are delivered to China. By expanding the service location, Herkules guarantees timely service and competent technical support for its customers.

Graffiti campaign at the Herkules Arena

Saturday afternoon, April 22 at the Herkules Arena. Usually, it is quiet here at this time, at least until the football teams of the 1. FC Kaan-Marienborn fill the spectator terraces. But not today – a graffiti campaign is taking place. Players of the “Siegerländer Weg” project and Herkules trainees are decorating the walls of the cabin containers with graffiti together with members of the local club “Stylefiasko e.V.”. The idea, concept and design have been developed in cooperation with the Corporate Communications department of the HerkulesGroup, who financed the campaign. The HerkulesGroup is the main sponsor of the “Siegerländer Weg”, a project that promotes sports and professional development in the region.

„The campaign took three days. It was great team work!” says Dawid Krieger, center forward of 1. FC Kaan-Marienborn’s first team and trainee industrial mechanic at Herkules. “When we first started, there were just gray industrial containers. Now,



Great commitment: the Herkules trainees Maik Liczmanski and Marvin Sting



Football motives decorate the new containers

visitors can see straight away who we are and what we do here: combining success in sports and career, on the job and on the football pitch.”

In front of numerous spectators and regional media, the First Chairman of the 1. FC Kaan-Marienborn, Manfred Leipold, introduced the new cabins on April 30 – an altogether successful football afternoon: the first team won 1:0 against FC Gütersloh. After the match, Christoph Thoma donated a barrel of beer for the celebration.

[You can watch a video of the graffiti campaign here: der-siegerlaender-weg.de](http://der-siegerlaender-weg.de)

Trade Fairs & Events



19th Annual Herkules Open House
August 18-19, 2017
Ford City, Pennsylvania, USA



Tag der Talente
September 8, 2017
Meuselwitz, Germany



Hot / Cold Rolling Day
September 26-28, 2017
Moscow, Russia



Metalexpo
November 14-17, 2017
Moscow, Russia

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Imprint**HerkulesNews**

Publisher: Maschinenfabrik Herkules GmbH & Co. KG · Eisenhüttenstr. 21 · 57074 Siegen · Germany

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