HERKULES

NEWS
2023

Aluminum Industry

Roll grinders from Herkules provide an absolutely flawless end result

Sustainability Management 4.0

Always at the cutting edge: Tailor-made modernization and digitization concepts

Profile Rolls

Individual and customized solutions for every machining task

Carbide & Steel

Produce steel products of the highest quality

Tailor-Made Products and High-End Technology

Universal in Use: Aluminum

Aluminum is an incredibly versatile material: Whether in the construction industry, the automotive industry or in electronics, for household products or in mechanical engineering – thanks to its outstanding resistance, low weight and high conductivity, this lightweight metal is ideally suited for use in a wide range of sectors.

Optimally Tailored to the Customer's Requirements!
Herkules roll grinders enable manufacturers to produce aluminum products exactly to their specifications. Decisive for the success is the absolute precision of the heavy-duty machines as well as the user-friendly operation.

Profilglass S.p.A. Puts its Trust in Herkules WS 600 Monolith™ for Flat-Rolled Aluminum Products

To ensure the highest geometric accuracy of the rolls and ultimate surface quality in the aluminum industry, customers worldwide rely on the excellent reputation of Herkules roll grinders – just like Profilglass S.p.A..

For grinding its work and back-up rolls in the cold and hot rolling mill, the Italian manufacturer of flat-rolled aluminum products has opted for a WS 600 Monolith™ roll grinder, which grinds rolls weighing up to 68 t. The decisive factor: Thanks to our unbeatable expertise, the machine is perfectly tailored to our customer's requirements. The machine masters a unique spectrum between the fine machining of the cold work rolls and the heavy-duty machining of the back-up rolls for the hot rolling mill.

Thanks to innovative Eddy Current and Ultrasonic measurement, no roll damage goes undetected. The Eddy Current sensor reliably finds cracks on the roll surface, while the Ultrasonic sensor detects defects both near the roll surface and deep inside the roll core. All systems can be coordinated via the KP 10 control system. The simple and user-friendly interface is intuitive and can be quickly understood without time-consuming training. Grinding and measurement data are recorded and processed in real time and are available on demand at any time.

The machine also boasts a foundation-free, space-saving Monolith™ machine design – an innovative alternative to the classic machine foundation for vibration-free and thermostable operation that significantly increases machining accuracy and thus guarantees a virtually flawless end product. The high surface accuracies which are a prerequisite for the production of aluminum sheets are thus achieved with ease.

Perfection in the Production of Ultra Thin Aluminum Foil

Aluminum is ideal for the production of ultra-thin foils which are used, for example, in the manufacture of sustainable and fast-charging aluminum-ion batteries. Therefore, the highest precision and accuracy is required in the production of the foils which are only a few µm thick – requirements that pose no challenge whatsoever for Herkules' roll grinders!

The All-Round Carefree Package to Meet the Highest Demands: North China Aluminium Buys More Herkules Machines for Unparalleled Quality in Battery Foil Production

The production of aluminum foil is subject to the most stringent quality requirements and even the smallest defects on the roll surface lead to unwanted impairments of the end product, which is only a few µm thick. North China Aluminium New Material Technology Co., Ltd., a subsidiary of North China Aluminium Co., Ltd. (NCA) and one of the leading aluminum foil manufacturers in China, has been impressing renowned companies around the world with high-end products for years. For more than 20 years, our Chinese customer has been relying on the high-quality standards of Maschinenfabrik Herkules for the equipment of its state-of-the-art plants in Hebei Province.

NCA has now decided to expand its machine park with two additional Herkules machines: a WS 450 L × 4500 CNC Monolith™ and a WS 450 × 5000 CNC Monolith™ roll grinder for machining work, intermediate and back-up rolls used in the production and further processing of aluminum foils for battery production.

Herkules roll grinders achieve the required perfection in geometry and surface quality of the roll which are essential for a first-class end product. In addition to the design quality of the machines, the unique control and measuring technology, which guarantees precisely defined, homogeneously ground surface roughness in geometric perfection, are also crucial for this. The "on the fly" measuring and grinding process, controlled by the intuitive KP 10 control, ensures significantly shorter machining times and thus higher availability. At the same time, the optimized stock removal extends the life cycles of the rolls used, resulting in considerable savings in costs, as well as the most precise corrections during the grinding process for a flawless end result.

Achieve the Perfect Grinding Solution with Tailor-Made Products

The Saray Alüminium team and the Herkules specialists on site in Cerkezköy

From l. to r.: Mehmet Güler, Mehmet Kilimci, Denis Albayrak, Murat Sarayli, Andreas Bongardt, Erman Aral, Aret Marancıoğlu

To expand its product range to include the production of high-quality and ultra-thin aluminum foils and sheets, the company Saray Döküm ve Madeni Aksam San. Turizm A.S. based in Cerkezköy (Tekirdag Province), a manufacturer of aluminum extrusion products, composite systems and industrial sections/profiles, has decided to purchase a WS 450 S × 4500 CNC Monolith™ combination grinder. The work and back-up rolls with diameters ranging from 250 mm to 1,000 mm that will be used for aluminum foil production in the future will be reliably ground with precision on the new machine.

"We are of course particularly pleased about this new reference in the aluminum foil market which is so important for us and, above all, is growing strongly," explains Denis Albayrak, who has been supporting the sales team at Maschinenfabrik Herkules and looking after the customer since 2022. "In the customer's new rolling mill, aluminum is converted into a form that can be used industrially by producing very thin sheets and foils that are light and durable, but at the same time incredibly strong," Denis Albayrak continues. "In order to be able to produce the high-quality, ultra-thin aluminum products newly added to the customer's product range, the quality of the roll surface is of utmost importance. This is why the customer decided to have the machine additionally equipped with our extremely accurate and reliable measuring systems, the C-frame 3-point measuring system and our laser measuring device Roll Surface Inspection System (RSIS). The best possible grinding results can thus be achieved."

The C-frame calipers from HCC/KPM are highly accurate devices for measuring rolls. The compact and robust design with swiveling arms makes the caliper suitable for both very small and very large roll diameters. Together with HCC/KPM machine controls, the C-frame caliper allows "on the fly" corrections to be made, i.e., during the grinding process. The result: maximum efficiency and high-precision ground rolls.

For the automatic detection of surface defects on the roll, HCC/KPM offers the laser measuring device "Roll Surface Inspection System" (RSIS). In the post-process, the RSIS detects the reflection of a laser beam on the roll surface and evaluates it. Machining flaws such as chatter and feed marks, commas, clouds and similar imperfections are thus reliably detected.

"Thanks to our hydrodynamic lubrication and the double vee guides, the grinding head is always optimally guided for both small and large rolls, and this design ensures optimum grinding results and a long service life for the machine."

The combination grinder is also equipped with combination steady rests and soft loaders. Both contribute to the safe operation of the machine and prevent possible damage during loading and unloading.

Denis Albayrak (Age 46)

Position in the company:
Sales representative at Maschinenfabrik Herkules

Area of responsibility:
Grinding machinery sales

What do you enjoy most about your work here at Herkules?
I love dealing with people, which is why I ended up in sales over 20 years ago. I often make intuitive decisions, and I'm usually right. Thanks to the many familiar faces at Herkules and the positive atmosphere in the team, I was hooked from the start. I have the feeling that everyone in the team is pursuing the same goal. And that is ultimately the key to success.

What fascinates you most about Herkules?
I am totally fascinated by the enormous vertical range of manufacture within the HerkulesGroup. I can't think of any other company that has such a high level of added value. Even though I don't know why exactly, I'm particularly fascinated by the model carpentry department. Unfortunately, this is a profession that is disappearing more and more from our home region Siegerland. That's why I'm really happy that we still have our own model carpenter's workshop. Simply awesome!

What are the challenges in your job and what is your credo to overcome these challenges?
Challenges in our everyday lives are growing steadily and compared to the past, at a very fast pace. From my personal experience, I can only say that it sometimes makes sense to slow down, not to subject oneself to the general hectic pace and to make decisions with a clear mind. I'm also a big fan of classic virtues like respect, tolerance, fairness and loyalty – both in my private life and in my day-to-day work. These are qualities that are ideal for mastering many situations and challenges.

First-Class Geometries and Surface Finishes

Operators of cold rolling mills have relied on tried-and-tested Herkules technology for decades. The geometric precision of the rolls is the basic prerequisite for the production of high-quality cold strip in the aluminum and steel industry.

In order to form the respective metal and bring it into the desired profile, our customers opt for the proven Herkules technology for machining their rolls – because with the grinding and texturing machines from Herkules, they reliably achieve the first-class surface finishes and geometries during roll machining, which are the basic prerequisites for flawless cold strip.

Perfectly Ground Rolls for High Availability and Best Quality

WS 450 KL × 4500 Convinces American Customer for the Production of Aluminum Products

Once again, an American customer has placed its trust in the cutting-edge technical products of Maschinenfabrik Herkules and has opted for a WS 450 KL × 4500 roll grinder. Among other things, the machine is used to grind the work rolls for the cold rolling mill for the production of aluminum foils of the acclaimed Herkules quality.

The high machine rigidity in combination with excellent damping properties guarantees grinding results at the highest quality level at all times. The "on the fly" measuring and grinding process controlled with the intuitive KP 10 control system ensures significantly shorter machining times and thus higher availability. To minimize downtimes in the rolling mill, it is important to detect defective rolls at an early stage. This is why Herkules has developed surface inspection technologies that reliably detect cracks and other defects near the roll surface that are not visible to the naked eye. The Eddy Current measurement reliably detects open cracks and changes in the roll's microstructure. This optimized stock removal also increases the service life of the rolls used.

The machine comes with the patented Monolith™- bed – the superior Herkules technology is made in sandwich construction with cast-iron ribbed top, fiber-reinforced heavy-duty mineral concrete and a bottom plate made of steel and special damping elements. Because there is no metallic connection between the bottom and top parts, vibrations are effectively damped. The integration of the workpiece bed and grinding bed into a common machine bed guarantees consistently accurate alignment even after many years of operation. The foundation-free installation on the shop floor itself also saves space and costs.

In addition, the customer has protected itself with an extra service package, which is characterized above all by fast and reliable spare parts delivery to effectively minimize downtimes and ensure that the customer enjoys the best possible service for decades.

The machine is assembled and installed on site by our experts.

Highest Surface Quality for Aluminum Sheets

Aluminum is the ideal material for modern heating and energy systems. But due to their outstanding durability and significant weight reduction, aluminum products are also becoming increasingly popular in the automotive industry, replacing heavy steel components.

The lightness of the materials helps to reduce CO_2 emissions and save fuel. In addition, vehicle performance can be improved in terms of safety, comfort, output, and design.

Customer-Specific Machining Requirements for Flawless Surfaces

Novelis Deutschland GmbH Trusts Herkules' Quality and Invests in a WS 450 KL × 5000 Monolith™

The surfaces of the ultra-thin aluminum products for thermal and energy components as well as aluminum sheets for the automotive industry must be absolutely perfect. Unevenness and surface flaws are not acceptable. Manufacturers of these products must therefore ensure that their rolls are always ground to perfection. To ensure the quality of the work and intermediate rolls with diameters of 550 mm, a maximum grinding length of 5,000 mm and a maximum weight of 4,780 kg (on steady rests), Novelis Deutschland GmbH puts its trust in the quality of Herkules machines and has invested in a WS 450 KL × 5000 Monolith™ roll grinder.

The machine impresses with equipment specially designed to meet the customer's machining requirements. Thanks to the VMS Vibration Monitoring System-PT100 at the steady rests, the vibration data generated during the grinding process is fully monitored, recorded and is directly transmitted and stored.

Thanks to HCC/KPM's highly sensitive and powerful measuring and inspection technology, defects are reliably detected on the roll surface as well as near the surface and inside the roll. Crack detection by means of Eddy Current and Ultrasonic measurement with creeping wave as well as the use of Roughness Scattered Light Detection (RSLD) to determine and document the surface roughness of the roll ensure perfect homogeneity.

The whole system is rounded off with our high-precision C-frame caliper for measuring the rolls to be machined.

The machine will be handed over turnkey to the customer's plant in Nachterstedt before the end of the year.

Thanks to its versatile equipment options, the WS 450 WS 450 KL × 5000 Monolith™ is ideally suited to any machining requirement

Machine Modernization by Herkules – the Economic Alternative to the Purchase of a New Machine

Tailor-Made Modernization Concepts
Sustainability has been a prominent topic in mechanical and plant engineering for years. With retrofit and modernization projects all over the world, Herkules is proving that machines can also be sustainable and yet still meet the highest demands.

Thanks to customized modernization concepts, machines are upgraded to the latest technological standards and thus meet the customers' high-quality requirements – for decades to come.

From the planning stage to on-site implementation – Herkules offers professional advice and develops individual concepts that are precisely tailored to the requirements and needs of our customers.

Our experts develop modernization concepts that increase the productivity and energy efficiency of your machine many times over.

Always on the Cutting Edge: Herkules Upgrades an American Customer's Grinding Machine to the Latest Technical Standards
Constantly increasing market requirements keep technical developments moving. Thanks to the modernization options at Herkules, it is easy for one of our American customers to increase the overall performance of their roll grinder. Some time ago, the customer purchased a WS III CPT 60200 × 13500 roll grinder as a retrofit machine – which, to ensure that it continues to meet the highest demands, is now being modernized by our experts.

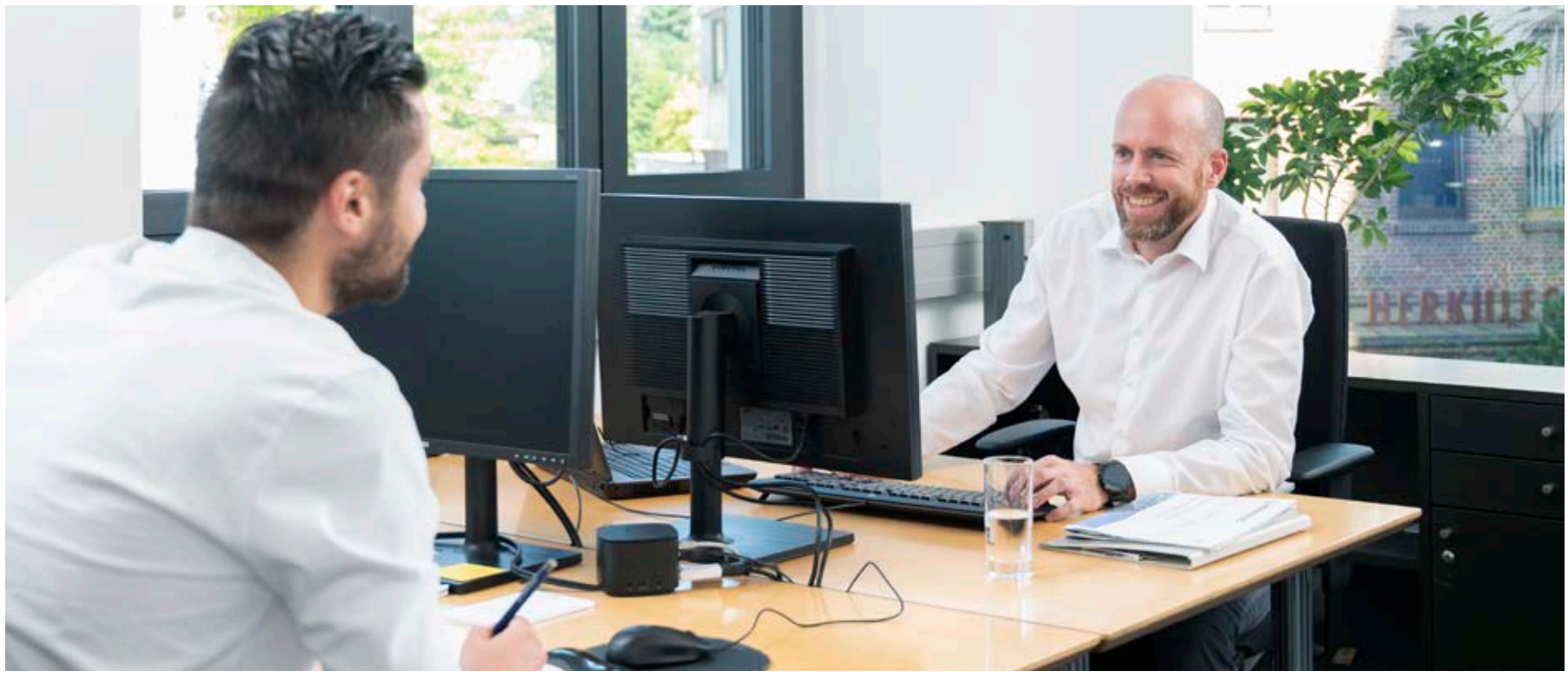
The advantages of such a project are obvious: In addition to increased production efficiency, the modernization measures ensure the functional safety of the machine for years to come. In addition to the mechanical overhaul of individual machine components, the most modern control and measuring technology, in particular, are being installed. A superfinisher (polishing unit) for finish grinding will also ensure the highest surface quality, while a Ventanip milling unit fully integrated into the system will optimize the produced roll profiles, as necessary. Both the optional equipment and the measuring systems, which record measurement results in real time and make them available on demand at any time, are easy and intuitive to operate via the HCC/KPM control system.

The excellent on-site service and training program provided by our North American subsidiary – both during and after the modernization – helps in guaranteeing a reliable and fast spare parts service as well as a wide range of training courses and also played a major role in the purchase decision.

Optimal machine configurations and technological concepts from a single source for the best possible customer service

Sustainability Management 4.0 – Step by Step into Digital Sustainability

At Herkules, sustainability begins with the conceptual design and planning of the machines with which our customers worldwide not only manufacture quality products, but also ensure energy- and resource-efficient production. In order to successfully meet this demand and thus support our customers in achieving their sustainability goals, Herkules is committed to efficient systems and state-of-the-art technologies right from the start.



Machines and systems have an impact on numerous dimensions of sustainability – from energy consumption and emissions to the amount of scrap produced during production. The constantly growing quality demands on the ground workpiece require increasing automation of production. Networking between IT, machines and systems is indispensable for a trouble-free and safe workflow of all manufacturing processes.

In order to optimally monitor the technical requirements and to be able to break down and structure the grinding and reject data, Herkules machines are equipped with intelligent measuring technology and software. The HCC/KPM software, which is perfectly adapted to the customer's respective systems and applications, brilliantly masters the task of optimizing and controlling production processes and creating a solid database that records, analyzes, and reliably outputs all the important information relating to the grinding process.

Mechanical Engineering Meets Digitization

Harald Kraft, Chief Operating Officer of HCC/KPM Electronics and head of the Technical Office Electrics, explains in an interview how state-of-the-art measuring and automation technology makes a significant contribution to sustainability.

How do we integrate the idea of sustainability starting in the design phase?
For a grinding process to be optimized correctly, the target variables and customer requirements for which the process is to be optimized must be known. These requirements or target variables can be, for example, roughness values combined with surface finishes, specific curve shapes on the roll surface and true running properties, or short grinding times. Excellent quality assurance and our highly qualified employees already ensure that during the design phase and the construction of the machine that the customer receives exactly that a machine which is optimally suited for his application and his industry.

We place particular emphasis on sustainable business models and the responsible use of resources – both human and material – in order to further advance the development of our technologies. We thus fulfill the sustainability principles of the Blue Competence Initiative, of which we have been a partner since 2021.

What role does automation play in the context of particular sustainability?
The topic of full automation plays an important role when it comes to acting sustainably. Especially in Roll Shops. The higher the degree of automation, the fewer errors occur. Thanks to our Modular Roll Shop Management System, or MRS for short, the operator can be sure that all settings are 100% correct and that the entire machining process is safe, automated and error-free. The automated processes include among others RFID recognition of the roll, or the automatic transport of the roll into the grinding machines, but also the automatic start of the roll grinding process. Thanks to this full automation of the individual work steps, the roll shop operates highly efficiently and at the same time conserves resources.

What are the strengths of our measuring systems?
The HCC/KPM measuring systems record the conditions of the rolls in real time during the grinding process and compare them with the initial values of the roll before its first use. The most important measured values here are the shape measurement and the inspection of the roll for cracks on the surface. Based on these values, the minimum necessary stock removal quantities are then precisely determined and implemented, so that both the workpiece and the tool are optimally protected.

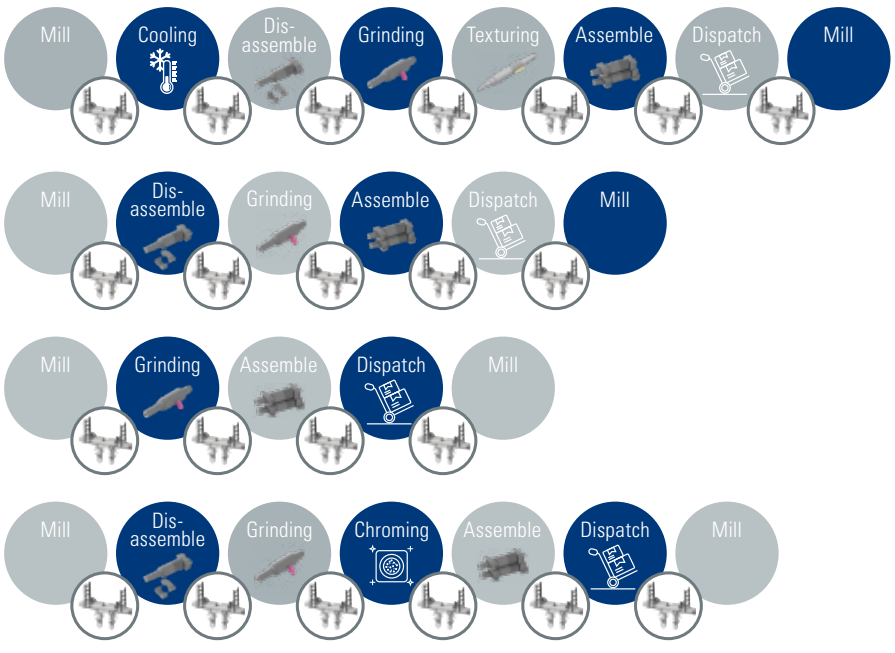
The data collected provides conclusions for further optimization and documents the achieved performance. Thanks to the detailed evaluation of the information, our roll grinders succeed in ensuring that the stock removal is reduced to a minimum and that grinding times are short. The rolls are, therefore, available again more quickly and downtimes in the mill are significantly reduced.

What are the advantages of this, also with regard to fully automated machine systems and Roll Shops?
The different levels of automation are reflected, above all, in the optimum communication of our individual components. This networking of all field devices, machines and measuring systems via EtherCat and Ethernet makes the system unbeatable.

What are the most popular technologies and why?
Our C-frame two-point measuring system and the Eddy Current measuring as well as the Ultrasonic technology are most popular with customers. This is because all three systems, especially the C-frame, achieve accuracies in the µm range thanks to the two probes facing each other. This precision and reliability, which have been the hallmarks of our measuring and inspection systems for decades, are repeatedly the reason for our customers to decide in favor of our systems.

Thank you for the interview!

**Campaign Management –
Simplify Work Planning and Evaluate Efficiency**



The campaign management of our Roll Shop Management System (MRS) increases the planning reliability and efficiency of your Roll Shop

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2

3

1. Roll measurement "on the fly": The C-frame measures shape, diameter and runout in the µm range with two probes that are continuously in use

2. Roll inspection using Eddy Current measurement for reliable localization of damage on the roll surface

3. Ultrasonic measuring system reliably detects manufacturing and fatigue defects inside the roll

High Productivity and Absolute Precision

The machining of carbide surfaces for wire, bar steel and rebar production, places the highest demands on the accuracies and surface qualities of the grooves in the rolls and roll rings used, especially in the finishing stand. To prevent the use of incorrectly machined rolls, Herkules groove grinding machines are the ultimate solution to avoid deviations in the profile as well as surface defects that directly affect the quality of the final product.

Herkules groove grinding machines guarantee efficient and economical contour and creep feed grinding thanks to high cutting performance, capacities and shorter machining times – to meet the highest requirements for surface qualities and accuracies.

Precise Grinding Results and Highest Shape Accuracies Even on Carbide Surfaces

Our Italian customer Officine Meccaniche Odolesi S.p.A., which already purchased a notch milling machine from Herkules in 2017, is once again upgrading its machinery with an HS3 groove grinding machine for contour and creep feed grinding of roll rings.

Roll rings are precision components whose quality has a significant influence on the manufacture of the end product in the rolling mill. Precise grinding to achieve the required surface accuracies is indispensable here.

With the HS3 groove grinding machine, the grooves of the roll rings can be reground with the utmost shape accuracy and to the highest surface quality using the creep feed or contour grinding processes, while also achieving the shortest possible machining times.

The high productivity and precision of the machine when machining the extremely hard surfaces played a decisive role in the purchase decision. The high cutting performance as well as the excellent damping properties and the high rigidity of the machine ensure precise grinding results and vibration-free operation.

The machine is also equipped with the HerkulesGroup KP 20 control system. This was specially developed for the diverse machining tasks. It incorporates all of the machine's control and regulating functions.

The machine has already been installed at the customer's site in Italy and is achieving excellent results.

Optional equipment allows the HS3 to be individually and optimally adapted to its intended use

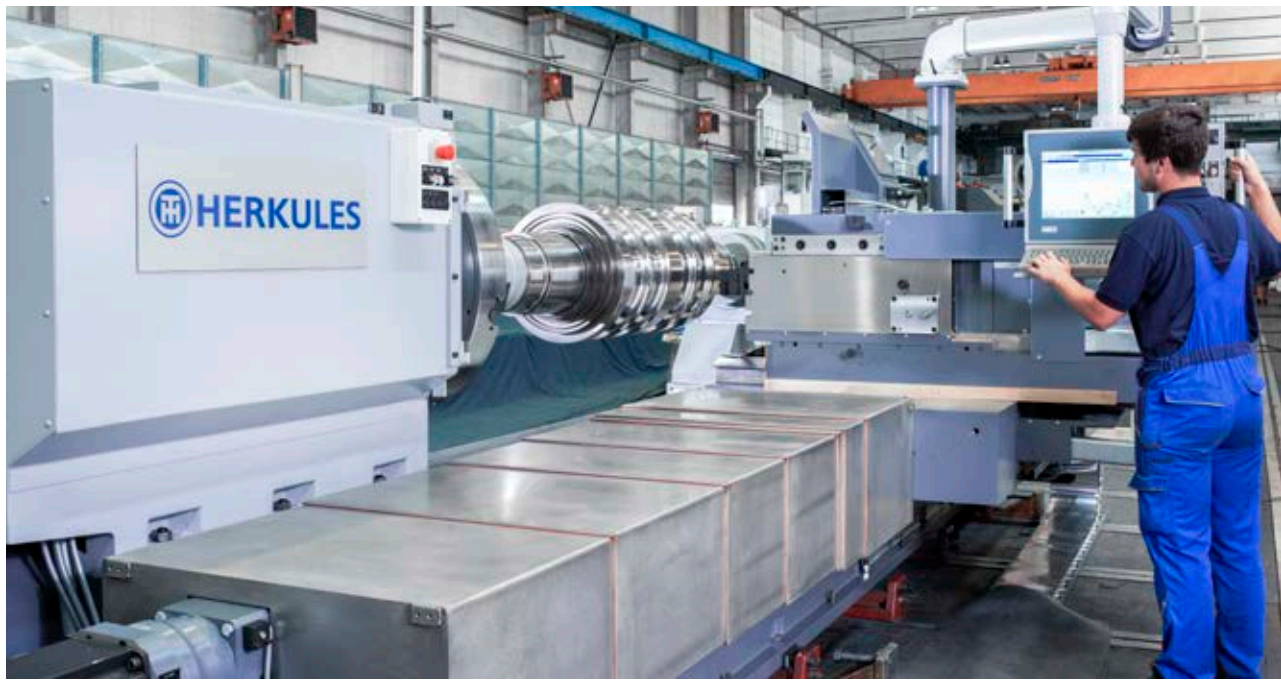
The automatic measuring device for the groove depth and exact positioning is integrated in the machine. The data can be called up at any time

Profile Versatility in the Production of Sectional and Bar Steel

The machining of profile rolls used for the production of large workpieces such as U-steel, beams, shipbuilding sections, but also special and bulkhead sections require high torques at the headstock, highest true running accuracies and a robust, durable machine concept.

The high-performance lathes of the P-series are characterized by their robust design, performance and efficiency. Thanks to extensive equipment options, the machines of the P-series can be used universally.

Based on many years of experience, each Herkules lathe is individually customized to the customer's needs. This is how Herkules finds the right solution for your task.



New Herkules Heavy Duty Lathe for Heavy Section Mill in Italy

Our long-standing customer SMS Group GmbH from Mönchengladbach, Germany, has purchased a Herkules P 500 × 6000 mm CNC heavy-duty lathe for the new section rolling mill of Duferco Travi e Profiliti S.p.A. in San Zeno, Italy.

With this machine, Duferco will be able to machine profile rolls with a diameter of 1,350 mm, a total length of 6,000 mm and a weight of up to 40 t for its new heavy-duty section rolling mill.

The decision to purchase this machine was made by the end customer Duferco mainly due to the excellent reputation of Herkules in the Italian market. The machine concept, which is designed for high cutting forces, and the special adaptation to the customer's specific requirements allow efficient machining of the rolls to meet the customer's exact accuracy requirements and enable maximum flexibility and universal applicability of the machine for machining different rolls.

Thanks to the additional integrated logo milling attachment, the customer can individualize his product and thus ensure the recognition value on the global market. For this purpose, the machine has been specially equipped with a high-precision master-slave C-axis for positioning the roll during the milling process.

Robust technology, high performance data and tremendous cutting performance – The P-series is the perfect solution for machining challenging, rotationally symmetrical workpieces

Steel Products of the Highest Quality

It is impossible to imagine our world without steel as a building material. It is resistant, hard and tough, yet easy to process with a heavy-duty lathe and its strength makes it ideal for load-bearing structures. As a standard material in mechanical engineering and as an important building material for steel structures and machines, including pumps, cranes, bridges or turbines, it provides the necessary safety and offers impressive durability and recyclability.

Herkules machines have proven hundreds of times worldwide that they meet the requirements of steel product manufacturers: With Herkules lathes, we have been setting global standards in terms of performance and precision for decades. Thanks to high flexibility, Herkules responds purposefully and individually to our customers' respective requirements and applications.

This unique combination enables our customers to produce hardened steel, drawn wires and bright steels of the highest quality.

Convinced All Along the Line: Canadian Customer Equips Complete Roll Shop with Herkules Machines

Gerdau Manitoba Steel Mill, a Canadian manufacturer of long steel products based in Selkirk, Manitoba, has chosen a Herkules machine for the third time with the purchase of a lathe, type P 400 × 4000 CNC, for the roll shop in its wire and steel rolling mill.

The reliability and solid quality of the products as well as the outstanding service of our subsidiary in North America have persuaded the customer to equip his roll shop exclusively with the German top products of Maschinenfabrik Herkules.

The lathes of the P-series are used for the machining of medium to heavy profile rolls as well as medium-sized workpieces such as forged shafts and rotors. Robust quality, high torques at the headstock and maximum true running accuracy are combined here with a unique machine concept which, thanks to its numerous equipment options, makes individual machining solutions possible.

Whether with additional attachments for milling, grinding or drilling – a P-series lathe is always designed precisely for the respective machining tasks to ensure the optimum in precision, productivity and efficiency.

The roll shop is an integral part of the Canadian rolling mill and is absolutely essential for Gerdau Manitoba when it comes to producing top-quality end products.

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