ABP INDUCTION
NEWS
OCTOBER 2021
9

# FULL DIGITALIZATION OF THE MELTING SHOP

## ABP AND ZORC PERFORM PIONEERING WORK AT SIEMPELKAMP

# TRADE SHOW KICK-OFF IN CHINA & USA

## ABP TEAM PRESENTS PORTFOLIO

# FOCUS ON INDUCTION FURNACE

## EXTENSIVE MARKET ACTIVITIES WITH GREAT RESPONSE

## Introduction

Digitalization is a process that is not something that can be touched or felt – digital services in general are often more difficult to grasp than classic products. This was also the reason why it was all the more important for us to be on site for the kick-off of the first fully digitized melting operation and to really be able to demonstrate things in action.

As such, what could be better than the combination of an intensive live experience in Siempelkamp's foundry operation accompanied by live explanations and visualizations of which digital mechanisms are at work in the background making the production process even better?

We have to take responsibility – for the future, for the world that we are leaving behind for the next generations. We are faced with many challenges that we have to tackle together, not tomorrow but today, as in the case of a traditional foundry with an innovative start-up and an experienced furnace manufacturer – this is how a livable future can be built.

*With best regards*
*and Glück auf!*
*Till Schreiter, CEO*

# The knowledge of man and machine integrated on one platform

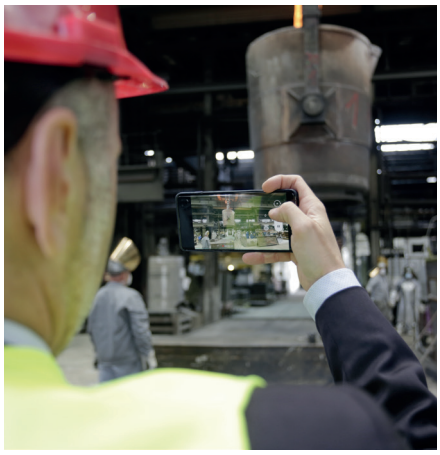
## Model project launched successfully at Siempelkamp Giesserei GmbH in the Lower Rhine area of Germany

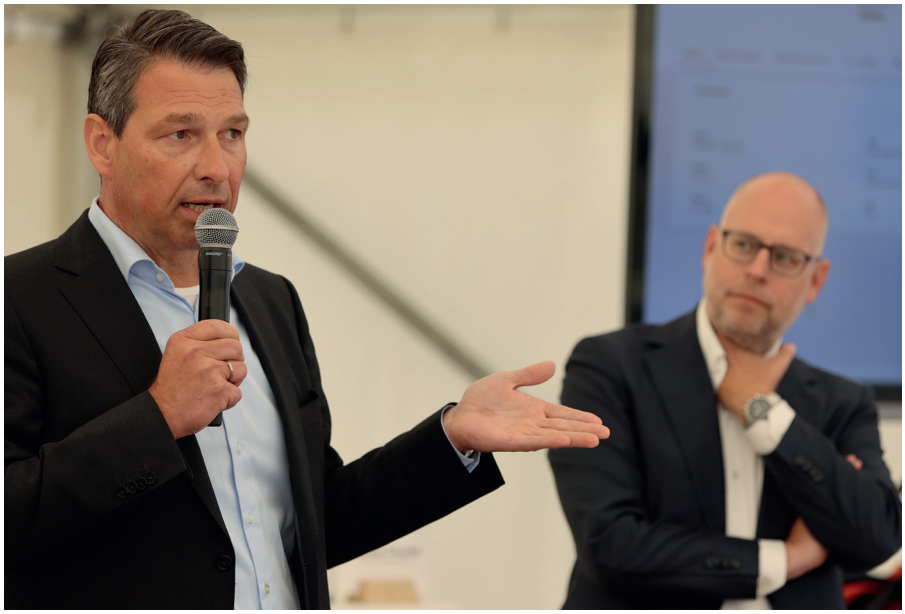
**A workplace of extremes – this certainly is the case when working in a foundry where metals are processed at temperatures of more than 1,000 degrees. The very highest level of safety during processing is of course crucial here, but so is the quality of the product at the end of the process. Up to now, this process depended primarily on the respective expertise of the smelter. This process is now digitally documented, analyzed and optimized by means of artificial intelligence with the „FoundryCloud" from the start-up Zorc Technology. The „FoundryCloud" is integrated directly into the ABP gateway and interacts seamlessly with the myABP platform. The Zorc solution, which was developed exclusively for foundries, represents the platform for predictive process control. Further digital business models in this environment are within close reach. The first platform of this kind has now been installed in Krefeld – ABP CEO and President Till Schreiter was on site together with Vice President Service Products & Digitalization Markus Fournell to present the concept to the public.**

The Siempelkamp Foundry has been facing major challenges that impact the entire metal processing industry: Reduction of energy costs and CO2 emissions, the topic of sustainability in its three dimensions in general, and thus competitiveness in the long term. Siempelkamp decided to take a great leap that was unique in the industry and demanded a trailblazing sense of pioneering spirit on the part of all those involved. The modernization of its induction furnaces heralds the beginning of a digitization offensive the likes of which have never been seen before on this scale in the foundry sector. The digital control of the plant now enables higher-precision production with even lower waste.

### ABP makes first complete digitalization of melting operation possible

Benefits range from lower power consumption to reduced costs and greater environmental protection. In addition, the foundry can now complete customer orders with much greater speed, efficiency, and manufacturing accuracy. Employees also benefit from the upgrade to their job description, they enjoy greater job security, and even safer workplaces.
The transition to digital control is being carried out gradually





*Till Schreiter and Markus Fournell presented the concept at an official kick-off meeting.*

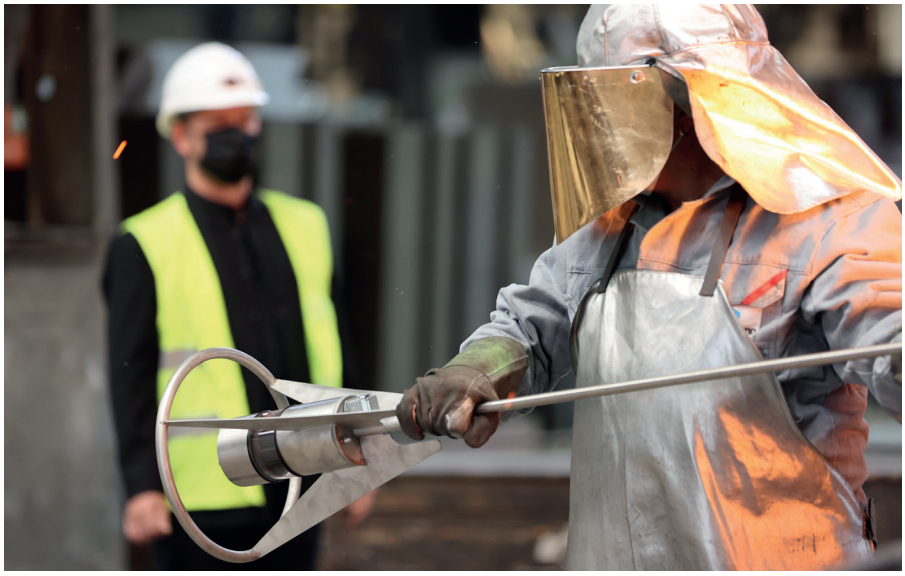
in several installation and test phases, one of which involves ABP's PRODAPT® melting processor, and is scheduled to be completed by the end of the year. The furnaces are then scheduled to start their fully digitalized operation in January 2022.

## Interfaces between systems and operating system

Why Siempelkamp has brought a classic system manufacturer on board with ABP Induction becomes quite clear when looking at the developments at the Dortmund-based company over the last few years: ABP has built up its very own digitalization division and today offers numerous digital services related to foundry operations – from virtual classrooms and virtual reality training to augmented reality support for maintenance and repair. Moreover, there are also components such as the controller by ABP Intelligence on the ABP gateway with the necessary interfaces to the operating system of the foundry. The myABP portal acts as the heart of the system and provides an overview of all relevant systems and processes – all elements from furnaces to scales to temperature measurements using lances are integrated, regardless of their manufacturer. With its data quality and transparency, it provides the foundation for a continuous optimization process.

With this, ABP has created the platform for the „FoundryCloud" software solution, which Zorc Technology has developed specifically for foundries. This new software for monitoring metallurgical control and documentation stores the foundry's operating parameters and transmits experience- and AI-based suggestions to optimize production directly to the employees. Previously, each casting was primarily dependent on the specific knowledge of the melter, but now the melter is assisted by the new software. It monitors the processes in the induction furnace and documents the parameters. It uses the data to develop suggestions for optimizing the process and sends the suggestions to the relevant employee, who can then use them to make adjustments. In the process, the software uses existing data and, thanks to the integration of artificial intelligence, is constantly learning. In this way, the data pool becomes steadily larger and the quality of the casting process steadily better. As a result, costly corrections and even rejects can be prevented to the greatest possible extent.

While 98 percent of the casting process is already firmly controlled, the digitalized system gives the Siempelkamp Foundry an additional increase in manufacturing excellence. The operating parameters that need to be monitored during a



*The ABP Gateway is able to record and process all data – the interfaces for all systems in the foundry are fully integrated.*

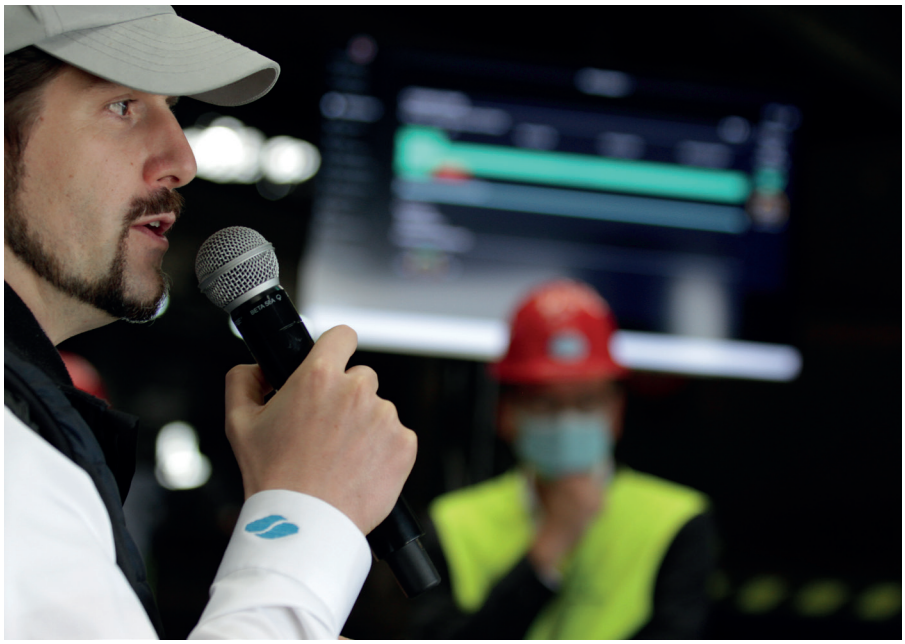
casting are highly complex and multifaceted: Loading, start and target temperature, process times, and last but not least the optimal use of energy – each factor plays a decisive role in the ultimate success of the process. As the digitized furnaces now collect, store and evaluate key data, artificial intelligence can be used to analyze and further process it.

## Comparing data, recognizing patterns

Thanks to the resulting algorithms, data can be compared and recurring patterns detected. The result: The software is able to solve previously unknown problems with an ever-greater degree of precision and supports the employee at the furnace in controlling the processes proactively. The user can therefore dedicate his full attention to interpreting the data and adapting the melting process to it in the best possible way. This is a particularly valuable aid when new components and factors have to be included.
However, the digitization of induction furnaces also shows how important the interaction between people and technology remains in the age of Industry 4.0: Employees and their expertise in terms of interpretation cannot be replaced in the process. The digital solution merely supports them in casting even faster, more efficiently, more correctly and more routinely.

## Learning platform for training

The Krefeld-based company has opted for comprehensive training courses to familiarize its employees with the new technology. The aim is not to train the foundry mechanics as IT specialists, but to expand their metalworking skills to include the use of digital applications. The three cooperation partners are therefore also increasing the value and scope of the foundry profession profiles and making their companies more appealing to applicants.
The topic of work safety will also be part of the virtual classroom training in the solution, which in addition to teaching the technological innovations has already won numerous awards. In addition to production support, the pool of data makes it possible to simulate crisis situations in a preventive manner, which employees can act out with the help of state-of-the-art VR technology. This therefore makes the foundry mechanic's workplace a little safer when dealing with the red-hot molten metal.



*At the kick-off, Dr. Georg Geier, managing director of Siempelkamp Giesserei GmbH, explained the operational processes.*

## Ecological footprint

At the same time, the site's ecological footprint is significantly improved as a result of the lower energy and material consumption. After all, the central unit is responsible for two-thirds of the company's electricity consumption. More accurate processes and even less waste can help reduce CO2 emissions in this area. According to initial estimates, this could result in total CO2 savings of up to 1,000 metric tons per year.
A look at the entire system also reveals a positive environmental aspect: The maintenance program that has been incorporated into the software solution, with its end-to-end condition control and monitoring, means that preventive maintenance can be carried out in a highly targeted manner. It thus makes a significant contribution to extending lifecycles. Transitioning to more energy-efficient processes also makes production more economical for the foundry. This represents a major competitive asset for a business in an energy-intensive sector. After all, energy costs at German foundries currently account for 25 percent of their gross value added. In view of the fact that electricity prices have nearly tripled in the past 15 years, this is an item in the budget that should definitely not be underestimated. The additional reduction in waste scrap also leads to savings in materials.
The new platform technology will therefore also have a noticeable effect on the company's bottom line. And this with a comparatively low investment volume – in comparison to the entire furnace system. And this is yet a further point that will enable the company to set itself apart from its competitors.

# ABP teams are back at international trade fairs

## Successful at Metal + Metallurgy in China and at AISTech in the USA

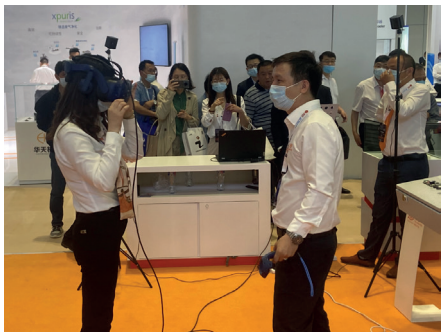
**The physical participation in trade fairs and events is once again possible in some countries around the world. As ABP Induction is represented by its teams internationally, the company has been able to attend several trade fairs, for example in the USA and in China. Trade fairs in Sweden and Germany are planned for the fall.**

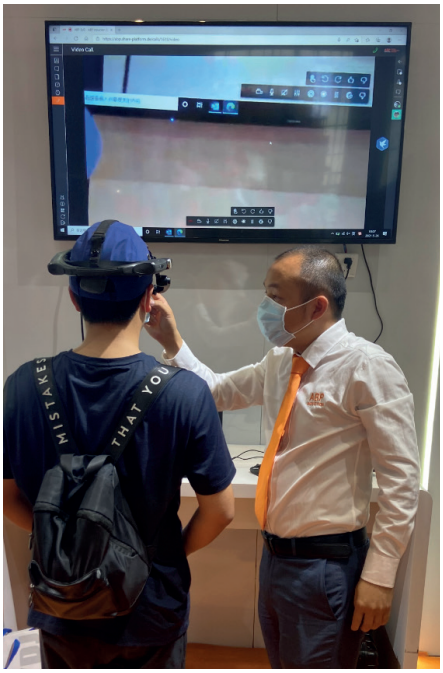

Fairgoers in Nashville, Tennessee, experienced a great event: Our ABP team was on hand at **AISTech 2021** to showcase our latest products and solutions. AISTech is an iron and steel technology conference and exhibition and one of the premier steel events in North America with over 300 exhibitors and over 4000 trade visitors. Jonathan Parker and Chris Carstens were on site for our team and presented mainly the digital solutions on more than 60 square meters.

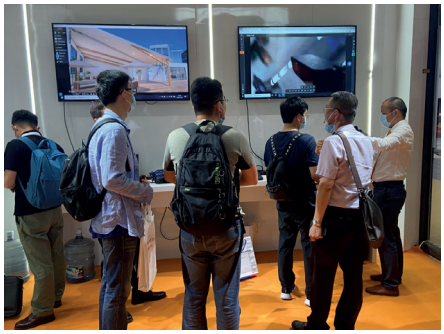
**Metal + Metallurgy China 2021** was held in Shanghai - ABP participated with an innovative visitor booth showcasing the best of both worlds – the new equipment technology and the digitization products. The ABP team in China did a great job leading up to the show to give visitors a fantastic experience and plenty of added value. The powerful IFM 11 and the IFM 7 were among the products on display – and right next, we exhibited virtual and augmented reality applications in the action area. Of course, visitors had the opportunity to test these applications live.

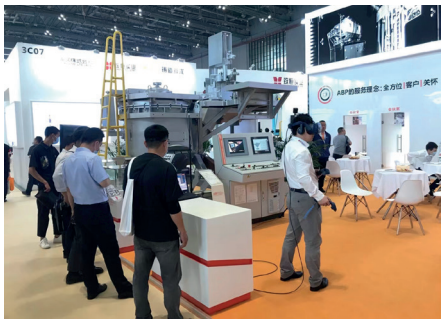
Other highlights included the ABP Virtual Classroom, which visitors could enter and explore, and AR services, which enable ABP experts to support people in foundries to resolve faults irrespective of location and time.

ABP colleagues received great feedback on both of these highlights at the show, motivating them to continue expanding both systems more intensively. And speaking of expanding: The great ABP team in China will soon move into new offices in the high-tech district Baoshan in Shanghai – we'll have more on that soon!







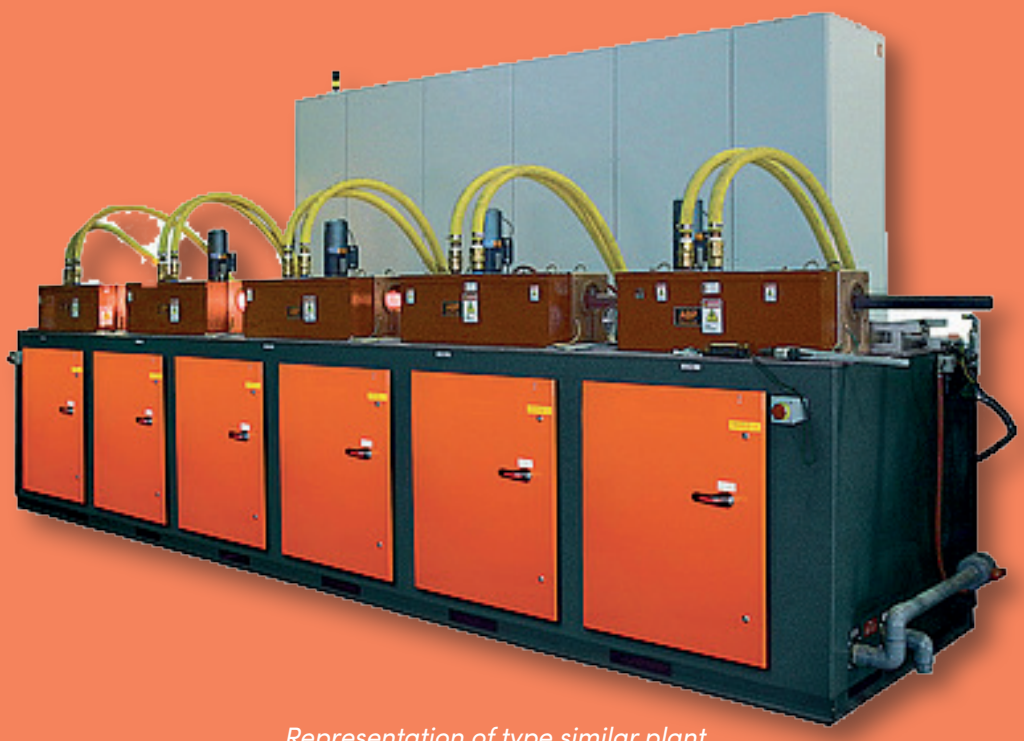


# Steeltec: High flexibility and individuality in demand

## Swiss group relies on ABP technology for steel processing

**Steeltec from Emmenbrücke in Switzerland, a member of the Swiss Steel Group, is increasing its flexibility in steel processing: ABP's ESS induction heater for bars will be installed there this summer.**

The ESS induction heating system, which ABP is installing for Steeltec, consists of six coils and has a length of eight meters. The system is equipped with an IGBT multi-converter, which features a total power of 5,400 kW. ABP's IGBT technology stands for highest efficiency. Its modular design and plug & play modules makes the customer is extremely flexible. ABP's zone control makes it possible to change the temperature curve according to different parameters.
The induction bar heating system is ideal for a variety of processes, such as continuous bar heating or a batch operation. The ESS type enables easy temperature adjustment to be performed for different steel grades while optimizing
axial and radial temperature distribution: Driven rollers convey the bars through the induction coils and heat them to rolling temperature. Conveying speed and heater output are continuously adjusted to suit the respective production conditions.
What is special about the ABP development is its focus on efficiency and sustainability: For instance, each zone can be regulated individually and the temperature profile can be adjusted accordingly. The ESS boasts low energy consumption, and the coil design relies on a robust construction and a specially developed copper profile for high electrical efficiency. THERMPROF® simulation software is also used to simulate and optimize the temperature curve. The ESS control system can be linked to a Level 2 control system for this purpose. This means that automation potentials can be fully exploited. The ESS control system also offers a wide range of functions to optimally adapt the intermediate heating to the rolling process.
With the heating system from ABP, Steeltec is ideally positioned to live up to its own claim as a leading supplier of individual solutions in the area of stainless steel long products. The group is one of the leading manufacturers in the global market for both tool steel and stainless long steel and is one of the two largest companies in Europe for alloyed and high-alloyed engineering steel.



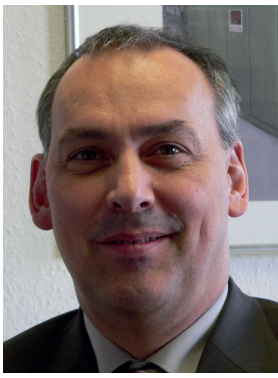
*Representation of type similar plant*

# ABP focuses market competence for steel mill technologies

## Induction furnaces and heaters for $CO_2$-neutral steel production in the future

**Digitalization and sustainability are the major topics in the iron and steel industry - and for ABP Induction. This is not surprising, after all, the steel industry is considered to be responsible for around nine percent of current global CO2 emissions. Thus, almost every technical discussion in steel mill technology addresses the switch to sustainable and long-term climate-neutral production technologies. With the CO2-neutral induction technology for heating and melting, ABP Induction provides an optimal solution for this.**

„With ABP Induction's products, we have gained a significant complementary technology in our portfolio," Stefan Fellner, Vice President Plant Solutions at ABP's parent company Primetals Technologies, also confirms. „The integration gives us the opportunity to offer our customers high-quality technical solutions with induction melting and heating technologies from a single source." Due to the high importance of this market, ABP has bundled global sales and product responsibility: Achim Thus (photo), in addition to his role as product manager for heating technologies, represents steel mill technologies on a higher level. Markus Hagedorn supports him as product manager for the optimized IFM-S melting furnaces. They are supported by the global ABP network with nine subsidiaries and local business partners. In addition, ABP Induction will continue to be present globally at the most important events in the industry, most recently at AISTech or ESTAD in Sweden with a joint presentation by Primetals and ABP (see page 5). The current trade fair dates can be found at www.abpinduction.com. ABP's products are technically optimized with a focus on the needs of modern high-performance steel mills:



- **Heating:** High-precision control of heating for flat material and long products, among other things as core equipment in the Endless Strip Production (ESP) of Primetals or in the long product area in the current project with partner Steeltec (see article on page 6).
- **Melting:** The proven IFM-S crucible furnace with melting capacities of up to approx. 900,000 tons per year offers the highest possible productivity, energy efficiency and automation.

## Hearing & seeing ABP Induction

If you want to keep up with our experts while you're on the go, you can access the ABP podcast. It bears our claim „People.Technology. Success" and is available on all standard podcast platforms, i.e. Soundcloud, Spotify, Apple Podcast and Google Podcast. There, our experts talk to journalist Michael Braun about the latest topics, explain new developments in detail and point out where the advantages of new processes, products and solutions are – exciting dialogs, not just for technology enthusiasts.

And our video format on YouTube adds the visual component. This is called „100 seconds ABP", and here you will get to know ABP employees, their areas of responsibility and the innovations in which they are involved in short video clips. Video is of course the perfect format to learn about visual highlights such as augmented or virtual reality.

## Imprint

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## We welcome two new apprentices

We are pleased to welcome two new apprentices at the Dortmund location. Volker Jeromin and Robin Nöther started their apprenticeships on August 1, 2021 as construction mechanics specializing in welding and electronics technicians for industrial engineering.

Rouven Grabowski (electrical engineering instructor), Frank Schlimme (construction mechanics instructor) and Dirk Hossbach (construction mechanics instructor) will supervise the two „newcomers" together with Sarah Culhaci-Rosenbaum (personnel officer, training manager). The two apprentices have each chosen a versatile and challenging profession in a craft and industrial environment with excellent prospects for the future. In addition to learning the practical skills in production, the training will also be completed at our training partner Außerbetriebliche Ausbildungsstätte HWK Dortmund GmbH as well as through vocational school instruction and exam preparation. ABP is therefore continuing its commitment to the high value of training as a response to demographic change and the shortage of skilled workers. We wish both new colleagues a good start to their careers.

The first applications for the next apprenticeship year are already starting to come in. Anyone interested in embarking on an apprenticeship at ABP can, for example, get a first-hand look at everyday life at ABP in Dortmund by completing an internship or a working trial.

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*A strong apprenticeship team:*
*(from left to right) Dirk Hossbach, Frank Schlimme, Rouven Grabowski with Sarah Culhaci-Rosenbaum and in front the two apprentices Volker Jeromin (l.) and Robin Nöther (r.) who started on August 1, 2021.*