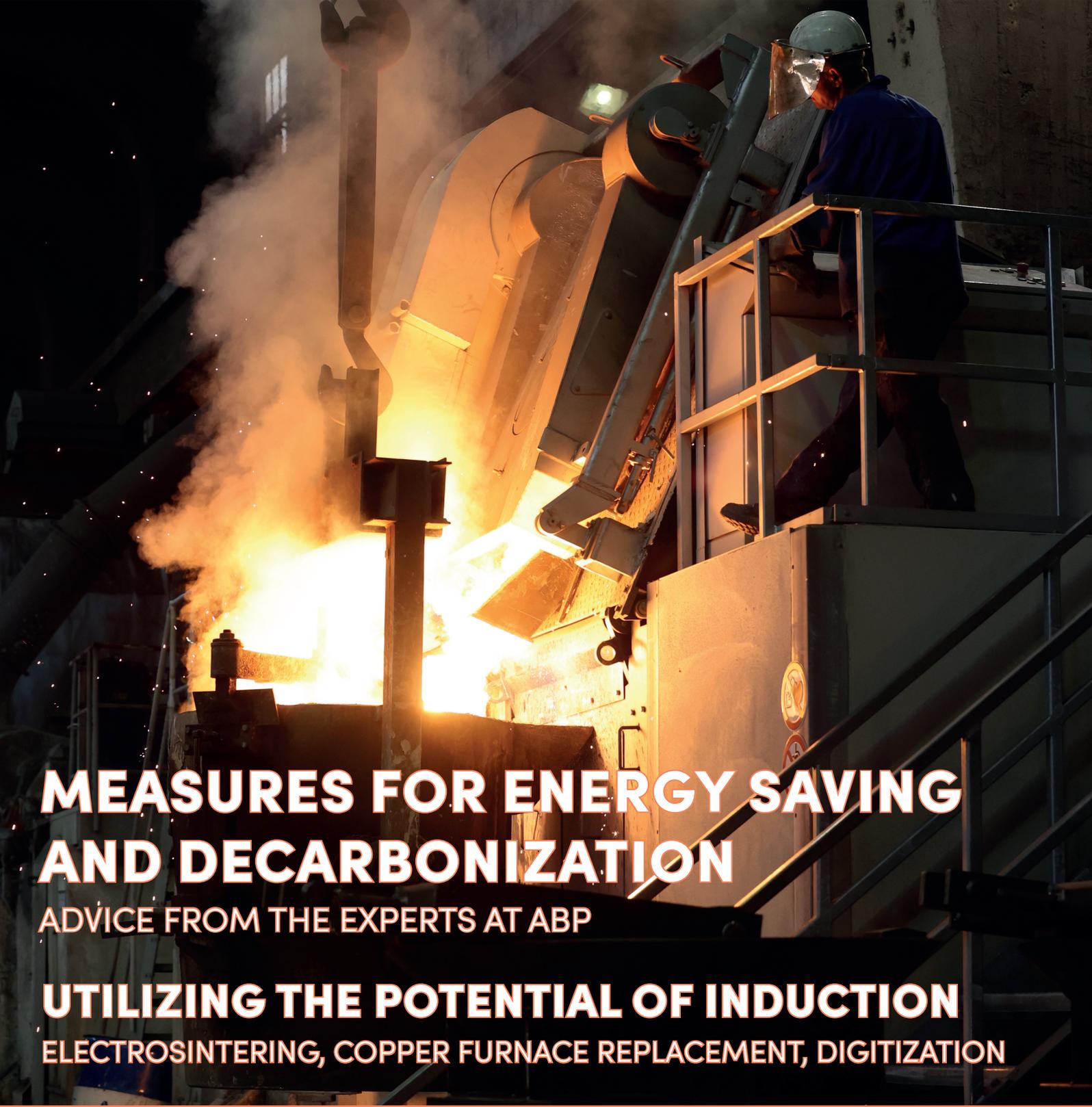


ABP
INDUCTION

NEWS
SPECIAL EDITION

13



**MEASURES FOR ENERGY SAVING
AND DECARBONIZATION**

ADVICE FROM THE EXPERTS AT ABP

UTILIZING THE POTENTIAL OF INDUCTION

ELECTROSINTERING, COPPER FURNACE REPLACEMENT, DIGITIZATION



Introduction

The topics of energy market development and decarbonization are currently significantly affecting our industry. Rising energy costs, uncertainty about gas supplies, and the pressure to save as much CO₂ as possible – these are all aspects that are currently on the agenda of every foundry.

At ABP, we have the answers. As a leading supplier of induction furnace technology, we can quickly help. Strategic in planning, for example when it comes to replacing cupolas with induction furnaces, with short-term measures as we help convert crucible induction furnaces to electro sinter forging, and prospectively when it comes to the complete digitalization of melting operations.

Our company has these important skills to face the challenges of the present and the future. Take advantage of them – we are here for you!

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

Independence from gas market developments with electrosintering

ABP can convert induction crucible furnaces in foundries

The energy market is under severe pressure: The uncertainty in the supply of gas has prompted the German government to activate the second stage of the gas contingency plan. As a result, the prices for gas and other energy sources are rising relentlessly – both of these aspects make reliable planning of daily foundry operations much more problematic. ABP Induction can provide foundry operators with its own technical know-how to help them in this situation: Crucible induction furnaces in foundries can be converted so that gas is no longer required for presintering, as this important work step is carried out using electricity as a source of energy.

Foundries that have opted for induction furnaces from ABP have already taken the first right step towards sustainable and CO₂-reduced production. The concept of inductive heating of metals using electric current can

now be completed by the use of electrosintering. With this conversion, gas as a source of energy can be further minimized. The sintering stencil is heated electrically instead of using gas.

Ongoing production is not affected by the changeover, so there are no long system downtimes. When the furnace is relined in the foundry, the conversion can be carried out by the ABP experts during this process. As a result, electricity is used for sintering instead of gas – the plant operator is no longer dependent on further developments on the gas market, both in terms of price as well as the availability of gas.

Foundry operators interested in converting from gas to electrosintering at their own facility can contact ABP Induction's service team directly. Just send an email to service.de@abpinduction.com and the team will get back to you with more information.



Replace cupola furnace with induction furnace technology

How modern foundries are facing decarbonization and what strategies ABP Induction offers for change

Modern foundries have to face up to the megatrend of decarbonization. Those who still have cupola furnaces in use should consider switching to induction furnace technology. ABP Induction, as a leading supplier in this segment, is ready for a quick change here.

During the last months it turned out that the decarbonization pressure will increase dramatically in close future due the environmental roles and the carbon taxation. All major industries started to investigate

alternatives related to this problem. The most foundries are urgently looking for solutions without using oil, coke or gas. We at ABP see a huge market potential to attend our customers on the way of decarbonization for their plants. On the other hand, we want to drive this procedure to support our customers finding alternative solutions for their technical and economical independence from fossil fuels. Our definite recommendation is induction furnace technology. The energy input of the induction

furnace is exclusively electrical. Heat is generated directly in the melting material and evenly distributed by the electromagnetic bath movement, without local overheating. No chemical or fossil energy sources such as oxygen, carbon or natural gas are required for process control.

Switch to induction furnace technology now - the ABP team will advise you immediately. Simply send an e-mail to info@abpinduction.com.



The move towards the first fully digitized foundry plant

Digitization ensures optimum performance of a foundry plant

Nothing works in the foundry environment without digitalization. If you want to actively manage the megatrends decarbonization and energy efficiency, the digital tools from ABP are the perfect tools for every foundry. Siempelkamp Giesserei GmbH in Krefeld has set an example and at the turn of the year 2021/2022 has taken the step to become the first fully digitalized melting plant in Germany. In doing so, the company is reacting to the current challenges on the market: skyrocketing energy prices, the megatrend decarbonization, and the ongoing topic of demographic change.

ABP Induction divided the project into three phases: The project was started with engineering and preparation. This involved the analysis of the data structure, the provision of data models and the connection of the equipment. The second step was deployment and testing. This included installing the ABP Edge Gateway, implementing the apps, and verifying data collection and communication. Step three then included the actual release and approval, including user training and defining the next steps.

„We are literally starting with the hardware in the first step towards digitalization: The PLCs are being rebuilt and upgraded, the old PC technology is being dismantled and servers are being set up to be able to virtualize the working environment,“ explains Wolfgang

Baumgart from ZORC Technology GmbH. The server works with a service orchestration tool that distributes the individual tasks into containers. This server then used the orchestration tool to start tapping into the individual data sources from the furnaces and temperature lances to the crane trucks and aggregate trucks like a data octopus. „Today, foundries have an internal Wi-Fi network virtually everywhere. Many sensors are therefore connected via Wi-Fi and are then integrated as IoT devices,“ Wolfgang Baumgart explains. To this end, ZORC employs microcontrollers to cost-effectively connect sensors or PLC systems. „This also works well for older systems: There are some good solutions to digitize these as well – and it can be done at reasonable prices. No large machine is lost in the digitization process. You can take existing systems into the modern age with available technology at very reasonable prices.“ So this is how you maintain the value of the system – a sustainable decision if you can keep and upgrade large mechanical systems („retrofit“).

The benefit as he sees it: Routine tasks, especially when it comes to documentation tasks, are automated by the system – this simple work no longer has to be done, so that the user can concentrate on the actual challenge. So, aspects of work organization can also be found in the change processes. „Here, another example from the field: In many cases,

employees are still classically „note-oriented“ – everything is printed and handwritten. The fact that this habitual structure is to disappear completely and be replaced by a digital process has to be communicated carefully,“ says Wolfgang Baumgart. But it helps, he says, that employees are already familiar with the new communication medium from their private everyday lives: „Everyone knows a cell phone and has one in their pocket. It’s the medium of choice for obtaining quick information, especially when you’re stuck in the work processes. For example, think of the work step of taking a temperature reading: The employee takes their cell phone, checks the specifications, and can put it aside again. So the cell phone is integrated into the work process via company applications – getting used to it is a process.“

A central component of successful digitization is the ability to allocate all production data. „For this, you need a workflow management in order to be able to describe something like this in a business process. We use our own language for this – the „Business Process Model Notation“. The individual steps of the production process are represented graphically and broken down into individual steps by the software. You can imagine this process flow like this: „The system starts a melting process, from which tasks are generated for various workstations, e.g. charging for the crane operator, preparing additions for the furnace operator or sparking off spectrometer samples

in the laboratory. Data is collected along this process and constitutes the „production tree“. This tree can be used directly to generate digital twins or to train artificial intelligence (AI). Structured data of this kind is therefore much more valuable than the unsorted data sets of classic „Big Data“ systems.

In summary, this means: All data is collected and evaluated, is available merged to the business model, and the individual employee is focused only on their task. So what the workflow management system has going for it is that the employee at the individual workstations only ever gets information on his screen or tablet about exactly his tasks that are relevant to him, so that he can complete his task.“

Managers, in turn, can then check the dashboard to see how the process is performing overall. This results in the possibility that external intervention can still be made in the actual work process. „If important decisions are pending, actions can be released immediately, which makes the process as a whole faster and more reliable,“ adds Markus Fournell.

Finally, a production tree is created that contains all the relevant information. The branches are formed by all raw materials and all measured values, all energy values and times; they therefore reflect as a process what is ultimately produced: The finished casting as the trunk of the tree. The roots of the production tree are then figuratively supplied by the quality department, containing data on tensile strength results, microstructure, dimension and surface; basically everything the customer wants to receive in the final documentation. „These trees provide two other significant benefits: As a plant operator, you have all the information for accounting together, from costs to material consumption. And: The



Have managed the changeover to the first fully digitalized foundry plant: Wolfgang Baumgart from ZORC, Markus Fournell and Yilmaz Yildir from ABP, and Dr. Georg Geier from Siempelkamp (from left).

trees can be used to train digital twins, which can be then used to simulate production processes and test variants. „These digital twins can be trained very well, especially for metallurgical processes – a key factor for process optimization in operations.“

At Siempelkamp, all processes now run together centrally in one system: „The trick is to bring the individual data together in such a way that there is convergent data that comes from the most diverse areas and subsystems in order to be able to interpret and use it,“ says Dr. Georg Geier from Siempelkamp. This

interconnection is not something that is trivial, he says: „We work in grown structures with very different characteristics, hardware and software architectures, and this has to be integrated. This is where the partners ABP and ZORC come into play – we wouldn't be able to do it without them. We need them at our side, because I am certain: unless we digitize our processes and business models, we won't be able to generate an acceptable ROI in the future,“ says Dr. Georg Geier.

The detailed report on the changeover can be found in ABP News 11 ([click here](#)).

The Meltshop Designer simulates every system

ABP proprietary development can predict the perfect dimensions of a melting plant

„How must our melting plant be dimensioned?“ „How can I increase productivity?“ „Which extensions pay off fastest in terms of ROI?“ – These are questions that foundry operators often ask themselves. And they are important questions, as they often mean high investments or an increase in yield. The Meltshop Designer was developed by ABP to design, dimension and plan a melting plant to perfection. To design a design and plan a melting plant perfectly, dimensioning and planning ABP has developed the Meltshop Designer. developed. This allows the plant can be dimensioned for the lowest possible CO2 emissions as low as possible.

„With this ABP proprietary development from our system engineering department, we are able to determine which solution is the most effective for our customers when it comes to material flow in the foundry,“ explains Patrick Lück, Sales Engineer Liquid Metals at ABP Induction. „Our experts can develop simulations for different foundry situations, present variants in terms of furnace design, and include different configurations from the ladles to the filling of the molding plant“. No matter whether the current production environment or variants for future melting processes are relevant for the customer – the basic principle is to find the bottleneck in the simulated environment that could disrupt production – in other words, to optimize processes and operating procedures.

A melting plant is configured for a production of 10 tons per hour,

but achieves only 8 tons per hour. „Thanks to the Meltshop Designer, we at ABP were able to simulate the actual situation – and found that the ladle transport did not meet the required production volume. Using the simulation, we were able to give our customer advice on how to improve their production environment,“ continues Patrick Lück.

Another example: A customer intended to buy three furnaces. „With the help of the Meltshop Designer simulation, we were able to determine that a tandem oven would already enable them to achieve the desired production volume and that it would make more sense to plan the third oven as a potential expansion – this way, they could save this investment for the time being,“ says the expert.

What makes the Meltshop designer so valuable is its variability. „We can simulate all materials by accessing a large database or incorporate new materials.“ Various one-off or periodic events can also be simulated, such as power supply limitation, a fairly common problem where energy providers reduce the power supply at certain times when more power is being drawn from other parts of the grid.

Initially, the evaluation from our simulations produce lots of figures. How high is the energy consumption? What quantities were produced?

„Of course, we can also simply make these bare figures available to the customer, but the actual added value only arises from the analysis conducted by our ABP experts based on the combination of the information,“ says Patrick

Key facts: About Meltshop Designer

- ABP's proprietary software development to predict dimensions of melting plants
- ABP brings anonymized empirical data into the process
- ABP experts provide recommendations for action in practice
- Find out more about the Meltshop Designer in the ABP expert blog at www.abp-blog.de

Lück and explains the further procedure: When our experts set up the simulation, they always include a presentation for the customer, based on which recommendations for action are then formulated.

Of course, the Meltshop Designer is constantly being further developed. It is currently available for the foundry industry, but will also be available for the steel market in the future. The adjustments for this are already in progress. Plans are also underway to include other plants in the simulation, even competitor furnaces – always with the best result for the customer in mind.

Information about ABP's own development „Meltshop Designer“ can be obtained from Patrick Lück by e-mail at patrick.lueck@abpinduction.com.

ABP focuses market competence for steel mill technologies

Induction furnaces and heaters for CO₂-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.

In parallel, ABP's parent company Primetals has established a new task force for „Green Steel". While holding the position of market leader in environmental innovations for the metals industry, Primetals Technologies now moves into another gear. A reduction in emissions, lower water consumption, greater energy efficiency, and improved circularity and yield – these are all examples of green steel activities.

Important aim of the new task force is to support the implementation of Primetals Technologies initiatives within the areas of green steel and energy transition. In April 2022, Primetals Technologies appointed Dr. Alexander Fleischanderl as the Head of Green Steel. The main goal of the task force is to position the company as the frontrunner in green steel production solutions.

Success Story: Transition at Kovis

A new era is beginning at the traditional foundry Kovis in Slovenia: The specialist for the production of castings made of gray and nodular iron has switched melting operations from conventionally heated cupola furnaces to CO₂-neutral medium-frequency induction furnaces from ABP. „Good ideas create the future" is Kovis' slogan, which the company has once again succeeded in demonstrating with this conversion. As a technology leader, ABP Induction is playing a decisive role in this megatrend in the foundry industry: With the IFM series, it boasts high-performance induction melting furnaces with state-of-the-art process control for demanding foundries worldwide in its portfolio. Kovis has made use of this: The plant is already in reliable day-to-day operation. Read the full Success Story on the transition in ABP News 10 – click here to download the relevant issue.

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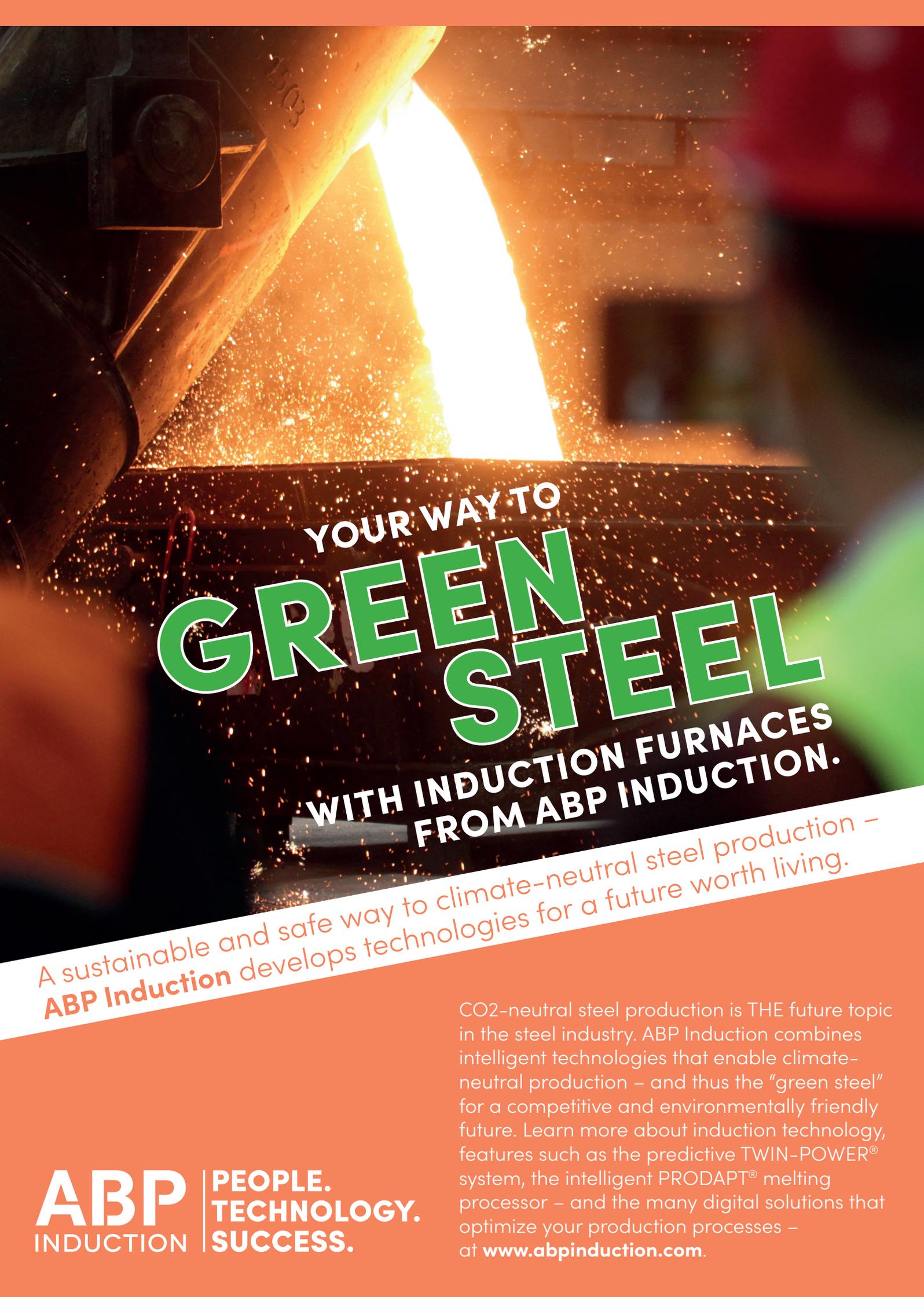
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**GREEN
STEEL**

WITH INDUCTION FURNACES
FROM ABP INDUCTION.

A sustainable and safe way to climate-neutral steel production –
ABP Induction develops technologies for a future worth living.

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INDUCTION | **PEOPLE.
TECHNOLOGY.
SUCCESS.**

CO₂-neutral steel production is THE future topic in the steel industry. ABP Induction combines intelligent technologies that enable climate-neutral production – and thus the “green steel” for a competitive and environmentally friendly future. Learn more about induction technology, features such as the predictive TWIN-POWER[®] system, the intelligent PRODAPT[®] melting processor – and the many digital solutions that optimize your production processes – at www.abpinduction.com.