On the journey to CO2-neutral production: Kovis replaces cupola furnace with induction furnace from ABP

Way to decarbonization as a convincing factor in successful changeover

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.

Kovis in Slovenia is a well-known player for its combination of tradition and continuous development in the production of castings. Development and innovation open up entirely new business opportunities for Kovis, and so the switch from the cupola furnace to the promising induction technology was a logical step when the foundry was due for modernization in 2019: Furnace system, molding system, sand preparation and many other components were to be replaced. In doing so, Kovis is also taking into account the challenges involved in environmentally friendly production: In 2050, the European Union wants to be CO2 neutral. Many industries are feeling the pressure to take action to decarbonize. Given the long amortization periods for capital goods in many industrial sectors, this already affects today's budgets. A key field in this context is the switch to low-CO2 and, in the long term, climate-neutral production technologies in the metal processing sector – as it still accounts for a dominant share of CO2 emissions in industry today. The increase in process and material efficiency as well as induction melting offer great ecological and economic potential. Kovis and ABP are consolidating all of this here, and in this respect the changeover at Kovis from cupola furnace technology to CO2-neutral production with induction furnace technology is not only a logical step, but the investment was also a far-sighted one.

"Our primary goal in switching to a different type of furnace was to increase the capacity and productivity of our foundry by 80 percent," explains Anže Tekavčič, production manager at Kovis, "in addition, the environmental factor was also very important in our decision. For one thing, the induction furnace reduces the carbon footprint compared to the cupola furnace. Furthermore, the energy efficiency of induction furnaces is much higher than cupola furnaces. Energy consumed per ton of molten iron decreased by nearly 50 percent." Still, the induction furnace offered far greater flexibility in feed material, both when looking at part size and steel-to-pig iron ratios. "The latter is very important, especially nowadays," says Anže Tekavčič, referring to high prices and material shortages on the market.

The important step in this project was the simulation of the potential needs and the corresponding future system of Kovis. The ABP Meltshop Designer was able to show off its skills as a tool: "This involves software developed in-house, which we can use to demonstrate which solution is best for the customer when it comes to material flow in the foundry," explains Alexander Keller, who played a key role in managing the project in Slovenia on the ABP side. The ABP experts can develop simulations for different foundry situations, present alternatives in the furnace design, and incorporate different configurations from the ladles to the filling of the molding plant. Regardless of whether the current production environments or variations for future melting processes are important to the customer, it is basically a matter of finding the bottleneck in the simulated environment that could disrupt production – in other words, optimizing processes and operations.

"This collaborative, innovative advance planning and ABP's technology expertise enabled us to take a decisive leap towards placing the order," says Alexander Keller. "In addition, one of our existing customers arranged a visit with Kovis so that the company had the opportunity to obtain detailed information from the ABP network." Ultimately, the ABP solution offers massive potential benefits in terms of operation and maintenance, especially about efficiency, system availability, and environmental friendliness. And so, once the contract was awarded, the system was installed and accepted in September 2020. Two IFM 7 induction furnaces with 6.1 MW power (TWIN-POWER®) and 11.7 t capacity have been used since then. The ABP automation package also includes the melting processor PRODAPT® Enterprise for demand-oriented control of the system and the melting process.

The interaction between ABP experts and Kovis staff on site went off without a hitch. The excellent handling of the project is also evident in the adherence to the planned project timeframe and the smooth commissioning. "The order from Kovis is therefore a great success for ABP Induction in Slovenia and an excellent reference for the entire Southern and Eastern European market. At the same time, the system represents the current state of the art in terms of digitalization," explains Alexander Keller.

The environmentally friendly operation of the ABP induction furnaces type IFM is based on different modules. Thanks to the TWIN-POWER® principle, converter power can be distributed freely, continuously and without additional switches to both furnaces. As such, scenarios such as melting with one furnace and simultaneous sintering or holding with the other are now possible. The concept results in increased inverter utilization, lower maintenance costs and lower investment costs compared to separate power supplies. In addition, with the PRODAPT® Enterprise melt processor already mentioned the PRODAPT® Enterprise melt processor takes over the demand-oriented control of the energy supply for melting and holding operation, cold start-up, sintering and communication with charging. Operating data and statuses are recorded and displayed in the HMI and processed for targeted data exchange with the plant management system. And thanks to ABP’s global presence, the sun never sets in the ABP world – so there is always an employee available digitally for Kovis whenever needed.

About ABP Induction Systems GmbH

ABP is a leading manufacturer of induction furnaces and systems for inductive melting and holding for the metal and metalworking industries. ABP is an expert in melting, pouring, holding and heating iron, steel and non-ferrous metals with design, production, assembly and services for foundries, forges and steelworks. The ABP Induction Systems Group with over 400 employees has companies in the USA, Mexico, Sweden, Germany, South Africa, Russia, India, Thailand and China. It is represented by service and sales partners in most of the world's industrialized countries.

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