

With the modernization at VONROLL CASTING, ABP shows what is possible with Retrofit

Perfect custom solution for higher availability of the plant, more occupational safety and a high degree of sustainability

ABP Induction has been awarded the contract for the extensive modernization of a foundry at VONROLL CASTING, a leading European supplier of complex, thin-walled and core-intensive castings. The order is an impressive example of how useful retrofits to existing systems can be and of the advantages they offer in terms of system availability, occupational safety and sustainability. With the implementation as early as during the summer inspection, ABP Induction once again proves how flexibly and quickly ABP can react to specific project requirements and implement them promptly and competently. The placement of the order by VONROLL has a clear statement: Even in times of Covid, investments are still being made in the industry – to be prepared for the future.

VONROLL CASTING is a customer foundry operating throughout Europe with headquarters in Emmenbrücke. The company has its own engineering center with integrated pattern making and post-processing. VONROLL CASTING maintains and masters a wide range of materials from cast iron with lamellar and nodular graphite to special alloys such as SiMo, Ni-Resist and bainitic cast iron.

Following the complete rebuild of the molding line a few years ago, the aim was now to realize an increase in the performance of the melting operation. VONROLL CASTING decided on a retrofit project of the existing plant. ABP Induction was chosen for several reasons: First, the engineers and technicians of ABP made a convincing case with a coherent concept. Here, no standard was required, but a flexible orientation based on the customer, the structural conditions on site (relatively low room height for a given area and use of the existing connections) and the implementation during the annual inspection work in the summer of 2021.

Additional arguments in favor of the retrofit were the extremely short delivery times that ABP was able to guarantee, as well as the stocking of spare parts, since the same spare parts can be used as for the existing plants. The retrofit is accompanied by a further improvement of the operational safety standard. For instance, the grounding of the melt is automatically tested with a patented ABP technology. Additionally, the single circuit cooling water monitoring system was redesigned and monitored with ABP OptiStream – an innovative system for analog cooling water monitoring of the DC link smoothing reactors as well as the single circuit monitoring in the converter.

It was also important for VONROLL CASTING that the warning thresholds can be adjusted directly and easily on the unit as required and that deviations (e.g. temperature exceeded or flow rate undershot) are detected and reported instantly. With ABP retrofit, these requirements are met and VONROLL CASTING will be able to further reduce its already outstanding reject values. During the daily walk around the converter room, the current measured values for flow rate and temperature recorded by ABP sensors can be read out directly.

During the individual circuit monitoring with ABP OptiStream, the intelligent IO-Link sensors directly communicate with the higher-level automation system. This allows processes over a long period of time to be displayed, stored and evaluated in the PRODAPT® Enterprise melt processor – a central basis for the success of the predictive maintenance philosophy that has been cultivated at VONROLL CASTING for many years now. What's more, the system can be diagnosed remotely – ideally via the innovative myABP portal and ABP Intelligence. myABP is the digital platform through which users can monitor their systems – seamlessly, across all manufacturers and machines. Maintenance planning and service – history can be viewed product by product. All machines can be set up in detail so that individual support can be precisely coordinated – including a web shop connection for spare parts. The calendar function provides a convenient way to view maintenance schedules. This not only makes the operating data visible, but also the dates when the machines and systems are not available for maintenance reasons. This efficiently supports personnel and production planning at VONROLL CASTING.

What exactly does ABP supply in terms of technical systems and solutions? In construction phase 1, which was realised in summer 2021, a Thyristor TWIN-POWER® converter with 4.2 MW was installed on the existing furnace system with 2 x ITMK 6R as a replacement for a single power converter with furnace current switching. The TWIN-POWER® operation has since eliminated the need for maintenance work on the furnace current changeover as well as the associated switching times due to the changeover of the melting furnaces. This has increased the overall efficiency and productivity of the plant.

For this purpose, TWIN-POWER® converters, condenser frames and cooling system were adapted to the existing plant and a melting processor was realized on a virtual machine, which ensures high availability of the system. A pump station with frequency converter and analog measured value recording reduces the power consumption and enables evaluation of the analog data with the ProfiNet interface in the melt processor. Also included in the scope of delivery as standard is a conductivity measurement and automatic switchover to a second pump after defined operating hours. Recooling monitoring is realized with magnetic inductive sensors to provide analog values.

The new converter control DICU3 is also used with the new converter, with all its advantages and connection to the digital world. The parent company of the VONROLL CASTING Group operates its own Digital Group and is well aware of the relevance of the new possibilities. ABP's digital competence was consequently an important factor in the decision for the selected retrofit program: The training of the operating and maintenance personnel is carried out parallel to the commissioning via the ABP Virtual Academy, i.e. contactless, independent of location and time via ABP's innovative and already award-winning training and further education concept. The ABP Virtual Academy offers two types of training: ABP Virtual Training and ABP Virtual Classroom. In the ABP Virtual Classroom, customers work with a digital twin of the furnace systems. Participants gain comprehensive product and process knowledge without having to waste precious time traveling, which makes the training more cost-effective and efficient.

The installation of all components was supervised by an ABP site manager. The installation was carried out by the customer himself, which meant another cost saving for the customer. Commissioning was then carried out by ABP Field Service.

In construction phase 2, the existing furnace cooling system will be replaced by a temperature-controlled furnace cooling system with frequency-controlled pumps in summer 2022. The flow of water will then be adapted to the power-dependent cooling demand, enabling a constant temperature level, energy savings and more efficient use of heat recovery. Here, the analogue signals from the new recooling monitoring system are evaluated.

About ABP Induction

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 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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