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With retrofitting to sustainable AAC manufacturing

To improve its competitive advantage and to eliminate an environmental impact of the production process, the building materials manufacturer modernised its AAC production premises in Poland. Through the application of innovative solutions of a German AAC technology supplier, the operational efficiency of the AAC plant improved significantly.One of the Polish leading manufacturers of a wide range of building materials (AAC blocks, sand lime bricks, paving stones) celebrated its 30th anniversary in June this year. Since the setup, the company has been paying a great attention to the current environmental issues and regulations concerning the production process sustainability and energy efficiency.

As a result, the AAC plant is equipped with its own sewage treatment plant, modern flue gas desulphurization installations and a closed technological water circuit. Last years the polish manufacturer has undertaken a number of investment plans to modernise and automate its production facilities to further minimize its ecological footprint to some extent. Most changes occurred recently in the production of AAC products.

Reasons to modernise

The production technology as well as the plant equipment must be uptodated to satisfy modern quality standards of the AAC industry. Due to the poor technical conditions of the machinery, it was not possible any more to manufacture AAC products of the competitive quality and of the sufficient range, such as blocks with a tongue and groove system or with gripping pockets.

On the other hand, the downtime of the equipment, the costs for repair and maintenance works, tooling times as well as the operational costs must be reduced significantly.

Experienced partner for best results

After some stages of negotiations, the Polish AAC manufacturer choose one of the leading AAC technology suppliers – WKB Systems GmbH – to realise this challenging project. The strong background of retrofit experience gave WKB Systems GmbH an undeniable advantage to execute the project in the shortest time in accordance with the total satisfaction of the customer.

The crane places a grate with a green AAC cake onto the GSM.

The GSM moves a complete block raw to some millimetres to raise a gap between them.

Based on the assessment of the available equipment and production process flows inside the plant, the experts of WKB Systems together with the customer developed a tailor-made retrofit master plan. It directly identified some opportunities across the factory to improve the performance in a fast, cost-efficient and effective way.

In order to eliminate or even to avoid the production stop periods, the modernisation was realised in some steps under the usage of basements available and the minimum of all the changes required.

Modernisation step 1: More output and a rise in quality with GSM

The amount of production wastes resulted from the sticking of AAC blocks after autoclaving and the following process of white blocks separation was extremely high. One of the widely proven solutions from WKB Systems was the integration of a green cake separating machine (GSM) after the cutting process but before autoclaving. This special facility prevents the sticking of AAC blocks and properly improves the penetration of vacuum before autoclaving as well as of the steam during the autoclaving process. The GSM was specially adopted in its construction to suit all the available equipment in the installation area of the plant.

The application of the GSM in the production process resulted not only in the production volume growth, but also in the reduction of autoclaving time by 20 minutes.

Modernisation step 2: Production process adjustment

To be able to operate the GSM it was inevitable to use hardening grates in the whole production process. So all the hardening plates with a closed surface were completely replaced with grates. The hardening carriages as well as indoor cranes were accordingly adopted for additional tasks.

Modernisation step 3: Retrofit of the cutting line

The cutting line was partially modernised and equipped with a tilting table. Some new cutting stations were engineered from scratch: the active horizontal cutter with a tongue/groove insertion units and the cross cutter with gripping pockets milling device. The main challenges were the usage of the old basement, limited area available for the installation as well as the integration of new cutting stations into the production process. So the experts of WKB Systems developed a 100% prototype.

The horizontal cutter operates actively, i.d. the cutter goes through the cake adjusting the position of its cutting wires automatically. It is a remarkable fact that only two wires are used to cut a wide range of AAC products with no manual intervention.

The tongue/groove insertion units are mounted on bar holders on both sides of the horizontal cutter. According to the blocks format, the needed blade bars are moved into the cake in automated mode of operation. So the time needed to retool this section as any block size change occurs is omitted. The format change takes place at the push of a button.

The separated AAC cake is ready to be autoclaved.

The cutting line with a tilting table to put an AAC cake upright the GSM.

The retrofitted cutting area of the AAC plant.

Two single wires cut a large variety of block sizes and formats.

The tongue and groove system is inserted by the active horizontal cutter.

Modernisation step 4: Up-to-dated technology for the mixing area

The last step of the project was the modernisation of the mixing tower of the factory. As the AAC manufacturer is going to produce AAC products with lower density class (250-350 kg/m³) and reinforced elements, the complete mixing area was modernised accordingly. The raw materials forwarding, weighing, dosing and mixing processes were equipped with the state-of-the-art machinery under the application of innovative production technology of WKB Systems GmbH. Two high-power mixers with special mixing aggregates and flow affecting units came into operation here.

On the way towards sustainable success

Thanks to the ongoing company's policy for innovative building materials accompanied with an environmental-friendly production, the manufacturer was mentioned in the Forbes Diamond 2022, a prestigious ranking for the fastest-growing companies in Poland. It is an important sign of acknowledgment for the company's values and business performance effectiveness.

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