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Aas Betong AS Uses Automation & Precast Modular Block Products to Overcome Labor Shortages in Norway

REDI-ROCK

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By some estimates, Norway is suffering a labor shortage of upwards of 60,000 people. Precast concrete manufacturer Aas Betong AS is tackling that shortage on two fronts. Within their own production facility, they have developed innovative automations to expedite their manufacturing process. To help with the lack of skilled labor in the construction sector, they are offering Redi-Rock precast modular blocks that are easier to install than other retaining wall solutions.

A Family History of Invention and Innovation

"My father was known as 'the magician Egil' in the local press," said Malvin Aas, director of Aas Betong AS in Tornes i Romsdal, Norway.
The family-owned-and-operated business started in 1972 when Egil produced facade stones for a firewall in his own house. He cast the blocks in his garage using a machine he designed, and the results were overwhelmingly popular with friends and neighbors. With constant inquiries, he quit his job as a plumber and started the company.
"He constantly designed new, unique products that were groundbreaking in the garden concrete industry in Norway," explained Malvin. As the only producer in the country making many of his products, he designed and refined his own production equipment too.

While the company eventually purchased some concrete manufacturing equipment, that initial ingenuity has carried over to the next generation. Malvin and his sister Kari split up responsibilities in running Aas Betong AS.
"We're a small company with 17 employees, so we all need to do lots of different things to be efficient and profitable," explained Kari.

The conveyor belt in the foreground is the first of three in the system developed by Aas Betong AS to automate much of the labor involved in producing Redi-Rock precast modular blocks.

Aas Betong AS stacks up forms in rooms heated to 24 degrees Celsius (75 degrees Fahrenheit) to decrease the curing time, allowing them to triple cast their Redi-Rock forms.

Aas Betong AS triple-casts during the warmer months of the year to build up inventory of Redi-Rock blocks in order to fulfill their sales orders.

walls to be built upwards of 6 meters (20 feet) tall. And, the Positive Connection blocks for MSE walls enable the product line to safely retain over 15 meters (50 feet) in height.

The simplicity of the forming system is one reason why Malvin was drawn to the product line. Redi-Rock blocks are cast in a steel forms with a rubber face mold to create a natural stone texture on the blocks. The forms are modifiable to create various specialty elements of the system, and the face molds can be swapped out to create different textures.

While many Redi-Rock producers leave their forms stationary and pour them with a concrete truck that moves through their facility or a concrete hopper on a crane, Aas Betong AS chooses to move their forms instead. Malvin has designed a system that automates much of the process, reducing labor and expediting curing. The system utilizes a forklift, three conveyor belts, a rotating table, and heated rooms.

Automating the Production of Redi-Rock

Malvin was the driving force behind bringing Redi-Rock precast modular blocks (PMBs) into the portfolio of products that Aas Betong AS makes. Noticing competition for their freestanding walls about 10 years ago, he wanted something to stand out from the competition.

"I was convinced that Redi-Rock was the best option," said Malvin after exploring a range of retaining wall options. Developed in the United States in 2000, the massive PMBs interlock with a knob and groove technology, allowing for gravity

From start to finish, Aas Betong AS's production process includes:

- A forklift operator delivers a form with a cured block to the first conveyor belt
- An operator uses a hydraulic spreader to open the form, reducing operative fatigue
- The operator hooks the block on a chain, lifts it from the form and moves it via crane to a second, cushioned conveyor belt
- The block is rotated from off of its textured face, moved down the belt, picked up via forklift, and taken to inventory

A majority of construction companies in Norway utilize hydraulic clamps on their excavators, which further expedites the installation of Redi-Rock precast modular blocks.

Redi-Rock retaining wall blocks, shown in the Cobblestone texture, complement the garden concrete offerings from Aas Betong AS.

- Meanwhile the now empty form moves down the first conveyor belt to a second operator who scrapes any residual concrete out of the form, cleans it with compressed air, and applies release agent
- The form then moves off of the first conveyor belt onto a table that rotates it 90 degrees and it goes onto the third conveyor belt in the system
- An operator closes the form doors and concrete is poured from a truck into the form
- The full form moves down conveyor belt three, is picked up via a forklift and taken to be stacked in a curing room
- After 4-5 hours in a room at 24 degrees Celsius (75 degrees Fahrenheit) the blocks reach 7 Mpa (1,000 psi) and are ready to be demolded, starting the process again

Even in their extreme northern climate, Aas Betong AS has refined a system where they can pour their Redi-Rock forms three times a day. Triple casting allows them to boost production to meet the demands of their sales orders and create inventory during the warmer months of the year. They currently are not producing Redi-Rock blocks year round due to weather constraints.

Installation Efficiencies Increase Sales

While Aas Betong AS has dialed in their production to make it as efficient as possible, the efficiency of the installation of Redi-Rock in the field is also a major selling point of the system. Contractors quickly become repeat customers when they experience the ease of stacking up the blocks like giant Lego blocks.

With a crew of two people and a piece of equipment rated to lift the blocks ranging in weight from 650 kilograms (1,400 pounds) to 2,190 kilograms (4,840 pounds), contractors can install the walls much faster than other types of retaining walls. Over three-quarters of the construction companies in Norway have hydraulic clamps on their machinery, which allows each block to be set with precision and further expedites installation. On average, 70-120 blocks can be placed in a day, totalling 35-60 square meters (375-650 square feet) of wall constructed daily.

The benefits of installing Redi-Rock to increase installation efficiency include:

- The blocks are dry stacked and interlock together with the knob and groove technology eliminating the need for any mortar work
- Each standard block covers 0.5 square meters (5.75 square feet), and XL blocks cover 1 square meter (11.5 square feet)
- Gravity walls can be built upwards of 6 meters (20 feet) so it means a less labor intensive process than walls with geogrid reinforcement where additional excavation and labor are necessary

"Redi-Rock is a good product that is easy to use," said Jøran Ræstad, general manager of Jøran Ræstad Ltd. and a customer of Aas Betong AS. "Over the years, we have been able to use a lot of different combinations and solutions on our walls to help our customers...It has great flexibility in a lot of jobs."

Striving for Continued Growth and Strategic Partners

Aas Betong AS received their first Redi-Rock forms eight years ago, and have seen consistent growth with the product line. They make about 50 products in three different textures each – Cobblestone, Limestone, and Ledgestone – and last year, Redi-Rock comprised 40% of the company's total sales.

Aas Betong AS continues to bring in new elements of the Redi-Rock system to broaden their problem-solving ability and expand their reach in the market. They also have retained exclusive rights to manufacture Redi-Rock in Norway and are currently looking for strategic partners. Concrete manufacturers interested in pursuing a partnership with Aas Betong AS to produce Redi-Rock are encouraged to reach out for more information. ■

FURTHER INFORMATION

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