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## **New standards for production plant**

The Danish company fibo intercon a/s is currently putting the finishing touches to the running-in of a new plant for production of insulating blocks at the Norwegian company, maxit Leca Borge. The plant is unique. It is fully automated and has a cycle time of only five seconds producing insulating blocks which meet the new, tighter insulation requirements and dimensions. A combination which has not been seen in this type of plant before.

In the past few years, requirements concerning the design of insulating blocks (called ISO blocks below) have been tightened. The insulation requirements have been tightened, and the demand for ISO blocks in dimensions other than the traditional ones has increased; maxit Norway therefore started looking for a partner to develop and deliver a plant which was able to produce in accordance with the new standards. However, the old production line in Borge was no longer able to keep up with the Scandinavian market's demand for ISO blocks. In spite of several conversions, the plant did not have sufficient capacity.

maxit Norway chose fibo intercon as its partner. At that time, the two companies had already had a close partnership for many years. fibo intercon delivered the first plant for production of ISO blocks to maxit as far back as in 1987, and the Danish company has also delivered several other plants and machines to the company.

In the pre-planning phase, the two companies were working closely together on developing a solution which met the new requirements concerning the technical properties of the ISO blocks and the capacity of the plant.

The result was a specially developed, fully automated production line. Because the fully automated system reduces the cycle time to a mere five seconds, the plant has a high capacity. The plant also has a flexible design, which enables it to produce ISO blocks in different dimensions. Borge thus produces ISO blocks in the dimensions 298 x 500 x 190 mm and 348 x 500 x 190 mm (width x length x height). The insulation value of the blocks is also up to 0.16 W/m<sup>2</sup>K without any additional insulation.

It goes without saying that all parts of the plant are screened off to meet personnel safety requirements. maxit Leca Borge has also chosen to place the production line in a newly erected factory building in order to create the best possible conditions for production and personnel.

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“We are very proud of the plant we have delivered”, says Jens Therkildsen, who is sales manager at fibo intercon. “The new production method gives our customer a significant competitive edge in terms of capacity and cost-efficiency. It bodes well for the future production and for the ability to meet the demand for ISO blocks. Especially the demand on the Scandinavian markets is increasing. And new markets must also be expected to become much more aware of the potential of ISO blocks. For, the product is just as suitable for insulating against cold as against heat.

### **The plant’s operating principles**

The production of ISO blocks starts with the unloading of pallets with standard blocks of lightweight aggregate clinker on to an outdoor chain conveyor. This conveyor carries the pallets through a gate to a depalletizing machine, where the concrete blocks are lifted from the pallets, layer by layer, and placed on a roller conveyor. The depalletizing machine is designed to handle concrete blocks stacked both lengthwise and crosswise on the pallet. It simply turns the concrete blocks to ensure that they are always placed correctly on the roller conveyor. After getting emptied, the pallet slides through a gate to an outdoor pallet store where it is stacked for later reuse.

From the depalletizing machine, the concrete blocks are carried along a roller conveyor to a block separator where the ISO blocks are divided into pairs, after which they are guided through a heater. This ensures a temperature of approx. 15 °C even in the winter period. This is necessary in order for the foam to adhere properly to the rough structure of the blocks. During the rest of the year, the blocks simply slide through without being heated.

At the other end of the heater there is a block inserter, which transfers the concrete blocks synchronously to the so-called ISO line, which is the actual production line. The block inserter ensures that the blocks are placed at the right intervals before reaching the foaming position. It also ensures that the undersides and ends of the blocks are covered with plastic slip foil to keep the foam between the blocks.

From the block inserter, the concrete blocks proceed to the foaming position, where a foam pistol injects polyurethane foam between them. The foam is environmentally friendly and produced without use of any CFC gases and ozone-depleting substances. The foam thus meets current environmental requirements as well as the requirements for sustainable production.

After foaming, the ISO blocks are conveyed through the 35 m long production line where the hardening process takes place. The line consists of a chain conveyor with L-shaped apron plates surrounding the blocks on three sides. The upper side of the blocks is covered with plastic slip

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foil, rotating on a belt above the foaming line. The slip foil prevents the foam from adhering to the plant and from flowing over the edges of the blocks. The closed design also ensure that the foam is able to penetrate into all the pores of the blocks, producing a stable, finished ISO block.

At the end of the line, a removal device picks up the hardened ISO blocks and places them in a block elevator which moves them to another roller conveyor. The conveyor guides the ISO blocks to a palletizing machine where they are accumulated until there are two rows of three ISO blocks. Defective products will be removed and scrapped. In the palletizing machine, the ISO blocks are lifted up and stacked on a pallet, one layer at a time. Like the depalletizing machine, the palletizing machine is designed for cross-palletizing in order to achieve the best possible packing of the pallet.

The palletizing machine is supplied with pallets from a pallet stacker which receives empty pallets from an outdoor chain conveyor. The pallet stacker is designed to handle two types of pallets, dimensioned 1,000 x 1,000 mm and 1,000 x 1,200 mm respectively. This ensures flexible production and packing of ISO blocks of different dimensions.

When the palletizing machine is finished packing a pallet the pallet moves along the roller conveyor for wrapping. Plastic foil is pulled around the pallet, and the foil is labelled. The pallet with the wrapped ISO blocks then slides through a gate and along the outdoor chain conveyor. Sensors ensure that the pallets are placed against each other in order to make the best possible use of the space on the chain conveyor. A forklift truck can then pick up the pallets and take the finished ISO blocks to the storeroom.

All processes are monitored and controlled automatically from three computer screens in an indoor control room. Electrical controls along the plant provide the employees with a full overview of the production process and any error messages. It therefore requires only a limited number of employees to operate fibo intercon's production plant.

## **Conclusion**

The partnership between maxit Norway and fibo intercon has resulted in a fully automated plant which produces ISO blocks in a more rational and cost-effective way than before. The plant's capacity is considerably higher than the traditional production method. The finished products fully meet current requirements and standards. At the same time, the customer saves resources while respecting both the working environment and environmental requirements. fibo intercon's plant thus adds considerable value to the customer and ensures that the Norwegian company is able to meet the market's increasing demand for ISO blocks for building purposes.

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