

Nordimpianti System Srl, 66100 Chieti (CH), Italy

Automated hollow core production factory employing an Extruder with flexible width capabilities

The last year has seen very difficult times for Ukraine, yet it may come as a surprise to many that in some parts of the country, the development and even strengthening of the construction sector continues. One such place, where small but stable growth is taking place and where the number of residential and non-residential new builds increases every year is the Vinnitsa region with its capital, the city of Vinnitsa.

One of the companies successfully supplying products to the construction sector is Kaskad-Budininvest. The core activity of the company has been for many years the extraction, crushing and sorting of gravel and other aggregates from a quarry located in the Vinnitsa region. However, after getting to know Nordimpianti at the construction fair KyivBuild 2013 the company set its long-term goals on expanding its core business to include the production of prestressed concrete products at a production site in the city of Vinnitsa.

When the time came to put the plan into action Kaskad chose Nordimpianti to be its supply partner after having analysed the market of machine suppliers for this sector.

Nordimpianti was chosen for the following reasons:

- It has more than 45 years of experience in the design and manufacture of equipment for the production of prestressed concrete products;
- It is one of the world's leading manufacturers of machines and equipment for the production of prestressed concrete elements primarily used in the construction industry;
- Nordimpianti casting machines (Slipformers, extruders and wet casters) allow the production of a vast range of products, such as: hollow core slabs (even up to 1 meter



Hollow core slabs production line

high), T-beams, lintels, ribbed slabs, wall panels etc., meeting the needs of a wide range of end customers;

- Nordimpianti has delivered production lines and machines to various countries in Europe, the Middle and Far East, India, Latin America. In the CIS countries, the company has delivered and installed production lines in Kazakhstan, Uzbekistan, Georgia and, of course, in Ukraine where, Nordimpianti is the market leader for the number of plants installed.

The project got underway in the autumn 2021. This project concentrated on two main concepts:

1. Flexibility

The production was based around the latest generation of EVO 2 extruders. The model E150 was chosen and config-

ured to allow the production of 1500, 1200 and 1000 mm wide hollow core slabs on the same production beds without the need to carry out the longitudinal cutting and thus producing less waste in the production process.

2. Automation

Kaskad-Budinvest made a strategic decision to incorporate as much automation to the hollow core manufacturing process as possible, reducing the amount of manual work required to a minimum and increasing worker safety.

Nordimpianti's machines have many in-built automatic capabilities. Nordimpianti's EVO 2 extruder boasts some fundamental characteristics which allow the operator to be almost completely free from the casting process.

- An intelligent concrete compaction control system, based on a system of load cells, integrated into the wheel assembly, in conjunction with a PLC from SEW



Multi-function bed cleaner



Casting of hollow core slabs 220mm high with EVO2 Extruder



High quality of 1.5m wide hollow core slabs



Elements being transported to the stocking area

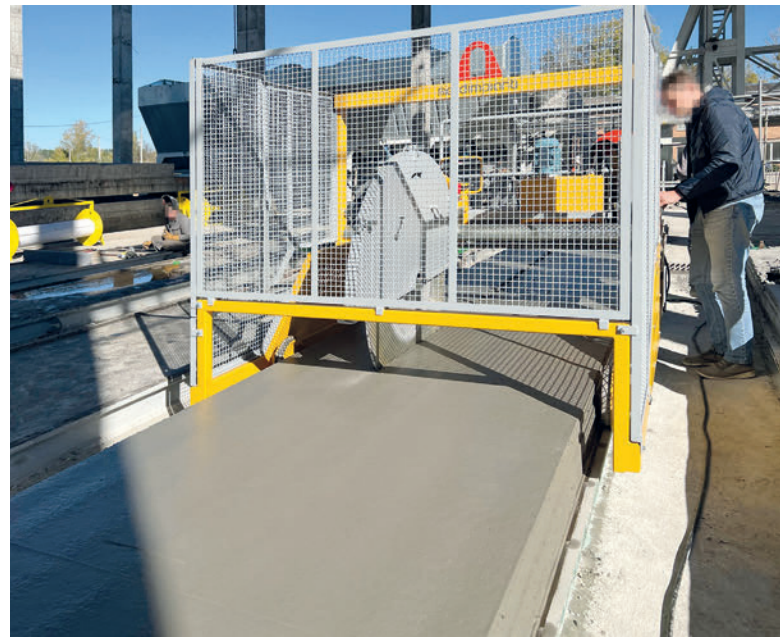


Automatic cross-cut saw

Eurodrive, can significantly reduce the operator's work load in the concrete casting process. Thanks to this system it is no longer necessary to regularly monitor and adjust the state of the working components according to the water content in the concrete delivered to the extruder. The system automatically adjusts the optimal operating mode of the machine according to the workability of the concrete;

- An automatic system for monitoring the level of concrete in the extruder hopper.
- An integrated database of machine settings for different panel and hole size configurations.
- A system for collecting production data for maintenance or efficiency analysis
- A separate drive for the outer screws optimising their useful life and thus significantly reducing the replacement frequency of parts subject to wear;
- A sealed gearbox with a permanent oil bath for the transmission ensure low planned maintenance

An automatic system for concrete distribution was also installed. When the extruder's hopper level sensor detects that the concrete level is low it sends a signal to the batching plant for more concrete to be delivered. A concrete fly bucket automatically takes the concrete from the batching plant, transfers it to the concrete distributor which, in turn, automatically finds the position of the extruder and fills the extruder hopper with a fresh delivery of concrete. This eliminates the use of personnel from the process.



Fresh saw for longitudinal cutting

Nordimpianti also supplied a transversal cutting saw with the ability to automatically cut all the elements along the entire length of the production bed.

The saw is equipped with a distance laser, which together with an encoder built into the travel drive system guarantees high cutting precision and reliability. The saw is equipped with a SEW Eurodrive PLC which controls the whole cutting process. In order to start cutting, the operator only needs to enter the required lengths of the slabs and the quantity of each type. With one touch of a button the machine will make all the cuts on the production bed, automatically.

An automatic machine requires high levels of built in safety and this saw is no exception. Nordimpianti has equipped this machine with obstacle presence sensors along the perimeter of the machine, as well as an alarm system and a system for automatic resetting the cutting process in the event of interruption or emergency.

The use of this machine greatly reduces the role of the cutting operator and in doing so offers more precision and avoids human errors. In automatic mode time is saved as machine positioning is faster than manual operator control.

Initially the project envisaged the purchase of two production beds with a length of 140 meters each.

However, with the outbreak of hostilities at the end of February 2022, the project was initially suspended as there seemed little hope for the project to continue further. However, due to the huge number of internally displaced people and the subsequent increased demand for housing, it was decided to continue with the project.

The project resumed in May 2022. The company's management decided to expand the number of production beds to six, as well as to purchase add-ons for the production of 160 mm high hollow core slabs, used in the construction of buildings requiring short span elements.

The maximum production capacity of the factory is up to 320,000 m² per year.

In September 2022, Italian specialists, together with Nordimpianti's partners in Ukraine, the Eurobeton company, commissioned the plant despite the presence of ongoing military actions.

The realization of this project has been the result of a partnership between companies that have supported Ukraine in difficult times and through their combined efforts, their knowledge, their innovation and experience have tried to help Ukraine to be in the best position to aid the country's rapid reconstruction. ■

FURTHER INFORMATION

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Nordimpianti System SRL
Via Erasmo Piaggio, 19/A
Zona Industriale Chieti Scalo
66100 Chieti (CH), Italy
T + 39 0871 540222
info@nordimpianti.com
www.nordimpianti.com



KASKAD-BUDINVEST
10, Aivazovskoho Str.
21000 Vinnitsa, Region Vinnitsa, Ukraine
T +380 67 430 1357

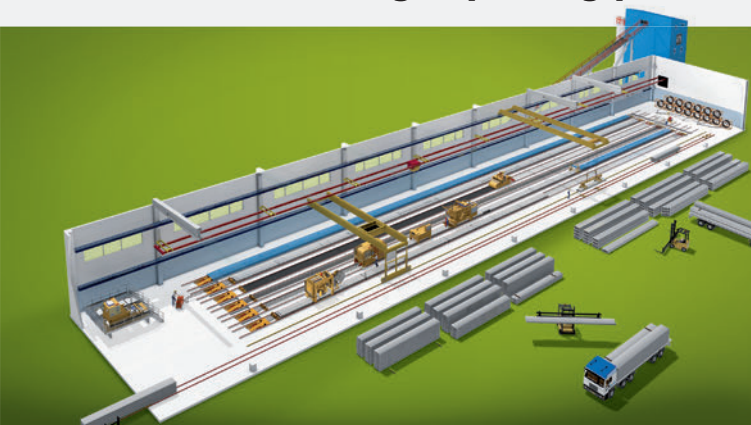
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Concrete Experience
ITALY

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Turnkey solutions for the production of high quality prestressed concrete elements



NORDIMPIANTI is able to supply complete "ready to go plant" for the production of prestressed concrete elements with the help of its specialized personnel.

Prestressed concrete element production is made up of different intermediate phases, each one accomplished by a dedicated machine or piece of equipment. For that reason, NORDIMPIANTI has developed a large range of machines and equipment able to work in every phase of the production and to suit the individual elements being produced.

NORDIMPIANTI offers customized solutions for the easy and efficient production of every type of prestressed concrete element.

☎ +39 0871 540222 - info@nordimpianti.com