Progress Group, 60313 Frankfurt am Main, Germany

State-of-the-art precast carousel plant in Poland

Precast concrete buildings are becoming very popular. In Europe their share of the housing market is steadily increasing by about 2.4% per year. This of course leads to more and more precast plants for prefabricated elements and enhances the need for modern solutions for those plants.

Wrocławskie Przedsiębiorstwo Budownictwa Mieszkaniowego „Mój Dom" S.A. has been active in the construction sector continuously since 1996. „In response to the modern solutions used in the construction sector, WPBM "Mój Dom" S.A. has decided to expand its production activity with the segment precast. Building the carousel plant was a natural step in the development of the company", says Wojciech Kurpiński, General Manager of Mój Dom and adds: "We decided to produce complex solutions of high quality, which are missing on the Polish market and opened the most modern plant for precast concrete elements in Poland in May 2021."

State-of-the-art carousel plant

WPBM „Mój Dom" Prefabrykacja S.A. Źródła / Poland opened the most advanced prefabricated precast concrete elements production / carousel plant in the whole of Poland - equipped with three separate production lines on different levels for different elements: floors walls (solid, insulated composite and layered) and other elements, i.e., stairs, balconies, columns, beams. The plant can produce over one million square meters of elements per year with a daily output of 3.000 m² delicate / filigree elements, 1000 m² walls and 50 m³ other elements.

Moulds for columns and foundation plinths

Overview of the whole production hall for moulds

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Equipping the new plant

During the selection of machines and equipment for the plant, the most important aspects were reliability, quality, technical solutions, and availability of service with spare parts. So, the supplier needed to meet those criteria as well as having experience and a high level of professionalism. The decision has been made in favor of the Progress Group, which, according to Mr. Kurpiński, has checked all the needed boxes. The companies of the group consist of Progress Maschinen & Automation specialized in automated reinforcement production, Ebawe Anlagentechnik, the expert for equipping whole carousel plants, Tecnocom which has provided various innovative moulds and also Progress Software Development who implemented their modern software - they all together created a highly modern plant for Moj Dom.

Growing precast market in Poland

The precast market is developing very strongly in Poland. Prefabricated walls and slabs are precisely tailored to the investment's needs and their detailed finish already is developed at the design stage. This minimizes the risk of imperfections or incompatibility with other construction elements. With the fully automated lines the production of top-quality products can be guaranteed also because they undergo rigorous QA/QC during the manufacturing process. Especially attractive for the market is also of course the price: The use of prefabricated walls and slabs speeds up the implementation of the investment by up to 50%, so the total investment cost can be accurately planned at the initial design stage and its final amount is lower than in the case of traditional solutions.
Wojciech Kurpiński says that he is convinced that precast elements will soon replace traditional methods.

Investing in the future – automated machinery

The Polish Association of Construction Employers has repeatedly awarded the company the "Developer's Certificate" which Moj Dom is again proving to be worthy of with the investment in a fully automated carousel plant in 2020. The precast products are of high quality, big durability and perfectly adapted to the needs of their customers. The automated production line is containing three fully automated floors working with machines that can produce „just-in-time" and a high efficiency. A concrete elements production plant with, among other highly automated machinery, also for example a flying buckets distribution of the concrete mixture aka the eCon Drive concrete spreader by Ebawe Anlagentechnik. Planning, designing, and production takes place with the use of CAD/BIM software, which eliminates errors occurring in the traditional production process.

Wall production

Within the wall production the Form Master shuttering and de-shuttering robot from Progress Maschinen & Automation is divided into 3 machines. After removing the precast elements, the pallet goes into the de-shuttering robot, which removes the shutters from the pallet and then the pallet is cleaned within the pallet cleaning device and sprayed with a special release agent. The pallet shuttering, pallet lifting equipment as well as even the pallet stacker and pallet transporting equipment all is highly automated and has been provided by Ebawe Anlagentechnik. After the cleaning the new element is formed. The difference to the rest of the automated system here is that the next step is manual, i.e., the meshes, cages etc. are inserted manually. For this reason, the M-System Mesh welding plant stands alone and is not directly connected to the carousel plant, which is almost completely automated. The mesh welding plant is special in even another way: Moj Dom can produce meshes, can discharge the flat mesh, or transport them to the bending system and then bend cages if they need them. In this combination this is a very seldomly provided solution by the supplier Progress. In addition to flat mesh and cages you can also make bent-up mesh (e.g. for solid walls) and discharge them separately. The nearby Pluristar special stirrup bender with run-off also stands

The automated plant has machinery for the reinforcement production integrated, so everything needed for the production of the concrete elements is produced in the factory itself.

There are three production halls for precast walls, slabs and stairs.

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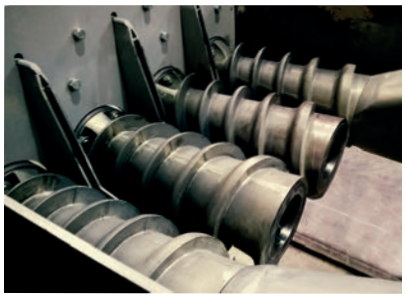

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Info

The shutters are placed exactly where they are needed in the element according to the plan – fully automated and within a short amount of time.

The turning equipment from Ebawe Anlagentechnik is fully automated and working precisely to the millimetre.

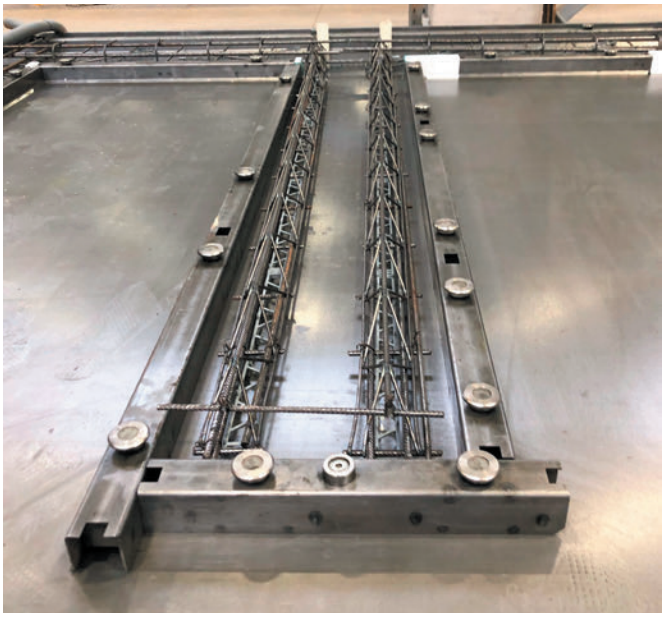
alone, and its production is highly depending on whether additional reinforcement is needed for the carousel plant or the construction site. If so, it can be produced here. Here Moj Dom can either work with the run-off if bigger products are needed or without run-off like a basic stirrup bender. All the products can be done with any needed cut-outs for doors and windows and thus provides a maximum of flexibility for the production.

Slab production

Also, within the slab production the Form Master shuttering and de-shuttering robot is being used to produce the slabs but in this case without its own storage robot, as the shuttering robot takes care of this itself. This saves space and costs. On the other hand, again, here it all starts with the pallet cleaning device and the release agent spraying device. It pretty much works like at the wall production, except that here within the reinforcement production the mesh can be bent automatically and that the lattice girders are welded by the Versa lattice girder welding machine onto the mesh, and everything is then placed in the pallet with the concrete. The Versa can switch the heights during the automatic production. Normally, the mesh is produced, placed on the pallet and then the pallet moves to the next station where the lattice girders are inserted. In this case, the whole product is placed in the pallet in one step. This has the advantage that you have the exact positions of the wire and lattice girders and they are accurate to the millimetre - everything works fully automatically. Another advantage is that the client does not have to place any plastic spacers underneath the reinforcement. In spite of prepared finishing tables, which would make manual touch-ups possible, everything should normally happen fully automatically without the operator having to intervene. With the Versa, there is another option of ejecting lattice girder; if additional lattice girders are needed for construction sites or other halls/circulation, the packages can be collected there and brought to the required location.

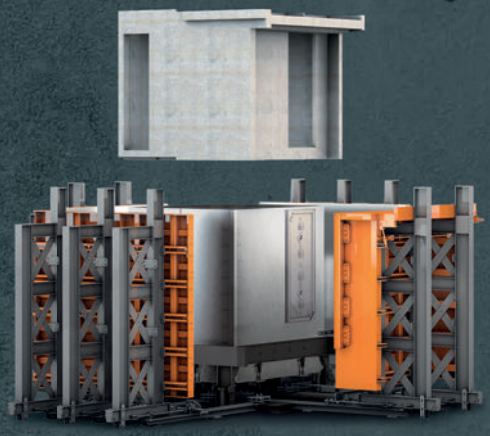
Stairs, columns, and other special precast elements

The third production line contains various moulds for the production of columns and foundation plinths of 34-meter length as well as stairs in many different sizes and shapes. The moulds are all provided by Tecnocom. Besides advanced and automated moulds for columns and plinths also a wide range of stair-moulds are producing flawless elements due to the great surface finish provided and the higher quality through the usage of the fully automated modern machinery.
A stair mould system composed by six vertical moulds Model V-Tec Plus 12 as well as two V-Tec Plus 18 - special automatic moulds with 12 and 18 steps respectively - and five stair ramp moulds Ramp-Tec Plus, were delivered.



With the Form Master shuttering and de-shuttering robot even the smallest openings can be formed automatically and with the exact specifications from the CAD data.

Product catalogue



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MojDom delivers prefabricated elements with the included cut outs already implemented.

The automatically adjustable ramp mould for stairs with landing - model Ramp-Tec Plus - offers automatic variation of the inclination of the ramp and the landing. With built-in slope sensors for the variation of the slope of the stairs and by automatically adjusting the slope of the landing with electric control, it is possible to adjust the mould to the specific requirement. In addition, the length of the stairs or the size of the landing can be adjusted and the surface quality can be output flawlessly. The main products that Moj Dom produce using moulds are columns, beams, foundations, stairs, and landings (various types), balconies and in the future prestressed elements.

Total software solutions to complete the automated plant

Progress Software Development implemented the software solutions that complete the automated plant: the MES system ebos® and the ERP system e^{rp}bos®.
The carousel plant is equipped with ebos which functions as an overall solution for work preparation, production, and process analysis. With the help of this holistic solution interface problems, due to a multitude of partial software solutions, are eliminated and all aspects of the manufacturing process can be carried out in a single user-friendly system. Moreover, with the innovative 3D visualization of the carousel plant, it is even easier to keep an eye on production.
Additionally, the e^{rp}bos solution, specially developed for the precast concrete industry, functions as a superordinate ERP system and is used for the planning and control of all business and production processes. From sales, calculation, project management, engineering, production and assembly planning to logistics and material management, all applications are seamlessly connected and managed via this central system.
Progress Software Development successfully implemented ebos and e^{rp}bos together, through an intensive lead time as well as sufficiently qualified specialists on site during the commissioning.
Mr. Kurpiński, General Manager states that: "The cooperation with Progress Group ran very smoothly and pleasantly. Thanks to the great knowledge and assistance of the supplier's qualified personnel, we were able to install and commission the ordered goods in a short time." and adds: "Also the trainings conducted by Progress Group remote as well as at our and their site were very professional and well organized. We will definitely meet on the next projects."

Moj Dom is a proud Green Code partner – for sustainable construction

Green Code is an innovative and sustainable building system that consists of insulated wall elements and acoustically as well as thermally optimised ceilings. The entire system is aimed directly at architects, developers, and investors. For precast concrete plants, the Green Code system offers comprehensive service and training, continuous product, component, and approval development as well as ongoing quality support through standards, guidelines, and documentation.

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The fast assembly on site is done by a well-trained and professional team, which knows how to work with the different prefabricated precast elements.

Against the common believes buildings made out of concrete elements are not plain and boring – concrete is one of the most stylish and loved raw materials by designers and architects.

FURTHER INFORMATION

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