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# At Kilsaran one of the most automated carousel plants in Ireland takes shape



**In early 2021 Kilsaran commissioned their new precast plant in Kilcullen Co. Kildare, which is one of the most automated precast concrete plants in Ireland. Kilsaran is Ireland's largest independent manufacturer of a wide range of concrete products. Founded in 1964 by the late Patrick McKeown in the village of Kilsaran in County Louth, this family-owned and run business mines raw materials from its own quarries and manufactures products at its various manufacturing plants across Ireland. The new precast concrete production facility in Kilcullen Co. Kildare features a new carousel plant which includes automated reinforcement and precast element production machinery as well as modern software from companies of the Progress Group.**

## Precast concrete produced to suit the Irish market perfectly

The carousel plant has been planned in a very detailed manner and only took a short time to construct. Kilsaran spent a lot of time perfecting the efficiency of the plant as well as the precast elements it produces. It is completely BIM oriented and not constrained by static molds. One of the most important features of the new plant is that the building dictates what precast elements are produced and not the plant itself. The plant can produce a full range of precast elements for the Irish market including solid walls, double walls, flooring solutions, as well as façade solutions.

"We manufacture the products to suit the building of the Irish market and not so suit our production." explains James Murphy, Business Development Manager at Kilsaran Precast.

Key to this vision is a production facility offering quality assured, traceable precast that are manufactured with precision. Cost and environmental benefits are delivered with on-time production requiring minimal storage. Each component is individually constructed, avoiding redundant processes, to achieve maximum cost benefits.

James Murphy refers to the selection of the machinery supplier: "When searching for a precast plant installer we were guided towards Progress Group by experts in the industry who noted that Progress Group were established and recognised as a market leader in precast machinery manufacture, following our initial meetings it was clear that Progress possessed the mindset that we required. Progress demonstrated very quickly a willingness to provide an innovative plant that could manufacture multiple products efficiently at the same time. It was important for us to have an innovative partner who understands the need for development in the precast industry. "

*Kilsaran Precast in Kilcullen, County Kildare is the most modern and automated carousel plant in Ireland.*

## Automation leads the way to significantly higher efficiency and quality

Progress Group came up with a carousel plant that allowed Kilsaran to produce the required range of products efficiently and automatically. The level of automation is one of its kind in Ireland and was one of the main drivers Kilsaran focused on while developing the plant together with Progress Group companies Ebawe Anlagentechnik as well as progress Maschinen & Automation and Progress Software Development. Automation saves time on-site and guarantees a dimensional accuracy, resulting in better and consistent quality. Kilsaran made sure to place robotics and automation wherever it was possible. The automation has been implemented throughout the entire production process to make sure the quality is consistently high. At the same time every step should be traceable, from the very inception right through to completion.

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*The Form Master shuttering robot places the shutters fully automated and precisely on the pallet surface as well as without any filling elements which would have to be disposed afterwards.*

*The M-System BlueMesh® mesh welding plant is ensuring a quick production of reinforcement for the precast elements produced.*

## Precast concrete elements production at a very high level – fully automated

The Progress Group shuttering system includes one for solid elements as well as one for half slabs and double walls. For the production of high-quality precast concrete elements, a storage robot is used, which selects the required shutters from the shuttering storage according to the CAD data transmitted by the ebos® control system. The plotter draws outlines or other information, such as the position of built-in parts on the shuttering surface. The Form Master shuttering robot then positions the shutters precisely on the pallet, according to the elements to be produced, and activates the integrated magnets of the shutterings. The electric sockets and magnets are installed automatically from specialized gripping tools, which ensure a highly automated outcome. Additionally the spacers for bespoke mesh are automatically positioned on a production pallet by a robot system called Mesh Spacer. During production, a positioner takes the required number of spacers from the magazine and places them on the exact places defined by the CAD-CAM data.

The patented Infinity Line® Notch-Free shuttering system of the Form Master makes centimetre-precise shuttering a reality, without the need for filling elements such as polystyrene fillers, which also complies perfectly with the various sustainability efforts of Kilsaran in general. A sophisticated combination system reduces the number of shuttering lengths used to a minimum.

A fully automatic concrete spreader eCon Drive® from Ebawe Anlagentechnik accelerates the filling of the shuttering and

*The production of line wire and cross wire without waste - by working directly from coil - without cutting mesh to size, as well as without laying work, also optimises the production flow.*

*The innovative traverse gripper automates the logistics process even for specially bent mesh and cages*

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*Ebawe Anlagentechnik installed a state of the art turning equipment which is securing an almost flawless surface quality.*

ensures an additional level of safety for the machine operators, whilst at the same time saving material through exact dosing. For compaction of the freshly poured concrete, two compacting devices are installed suitable for variable and particularly heavy loads ensuring a high-quality element surface at the same time. For half slabs a roughing equipment is available. After curing, the pallets containing the finished precast elements are destacked from the curing rack by means of an automatic controlled pallet stacker. For the manufacture of double walls, turning equipment serves for turning the first cured skin and connecting it to the freshly poured second skin.

Afterwards, the pallets still containing the finished precast panels are fed to the deshuttering robot recognizing the shutters by scanning the pallet surface and picking up the shutters fully automatically. In the next step the wall elements are lifted by dint of the tilting equipment with movable ladder simplifying the demoulding process for the operators.

The pallets are then fed to a pallet cleaning device for cleaning and the subsequent application of a release agent. The cleaned and oiled shutters are deposited length-sorted by the LPR robot back into the shuttering storage.

For insulated wall elements the new plant at Kilsaran is equipped with an insulation material cutter that cuts the insulation plates with precision in a specially developed water jet cutting method. The necessary CAD data are supplied by ebos. A special 3D cutting head also allows three-dimensional cutting processes. The advantages for Kilsaran lie in huge cost savings in material and staffing as well as less waste.

## Mesh welding plant M-System BlueMesh® with integrated bending system

In order to be able to achieve a very good reinforcement solution for the needed precast concrete elements, an automatic M-System BlueMesh mesh welding plant was installed. The mesh welding plant is operated by an MSR multirotor straightening-cutting machine for the reinforcement bars. The bars can also be cranked up lengthwise and crosswise


*With the automatic eCon Drive® concrete spreader connected with the software solutions of the modern plant the amount of concrete spread is calculated accurately and reduces waste.*


*Wall elements are lifted by means of the tilting equipment with movable ladder facilitating the demoulding process for the operator.*

for element slabs and welded for walls. The MSR straightening machines straighten, cut and bend rebar as well as process the reinforcing wire with a diameter of up to 16 mm directly from coil, thus optimising production. The strengths of the machine lie in its versatility as well as high efficiency and cost-effectiveness due to low power connection values, which are achieved by inverter welding.

## Innovative automated special mesh transport

Within the completely new carousel plant, equipped with the latest models of reinforcement systems, an absolutely novel concept was created together with progress Maschinen & Automation. The requirement for the reinforcement production part of the plant, was that the machine needed to produce not only straight mesh but also bent mesh for solid wall applications. Therefore a new logistics concept was developed and implemented. This concept ensures that specially bent mesh and cages can be transported onwards automatically with a new flexible gripper. Normally, the storage gantry robot grips the mesh with the help of magnets and transports it to the next station. However, this was not possible with multi-bent mesh and overlapping reinforcement as the magnets cannot react this flexibly. With the new traverse gripper the tongs can now flexibly access exactly where it is needed and can move the mesh into storage or directly into the prepared shuttering on the pallet. This new traverse system offers enormous added value to Kilsaran, as fewer additional bars have to be integrated by hand afterwards, and the mesh is placed automatically in the pallet, thus reducing labour requirement. This also made it possible to automate the transport to the next processing step of mesh / special mesh bent on all sides. The new traverse gripper also automatically transports the mesh one level down to where the pallets are and positiones the mesh precisely on the pallets.

## Software – ebos and stabos

The automation begins very early on in the planning phase due to the advanced software solutions and is implemented in the plant up until the final steps of preparing the elements for transportation. Not only is the production facility itself fully automated, but the information is delivered using the advanced PXML system. Punch Consulting works in collaboration with Kilsaran to provide BIM support and structural analysis for each building project with direct information supply to the factory. The software solution stabos, which is now implemented with every progress reinforcement machine as a standard software since 2021, is used to record and evaluate production data. The centrally collected data can be used to increase the productivity and quality of the plant. In combination with ebos a comprehensive software solution for work preparation, production and process analysis, which addresses all aspects of the manufacturing process, from start to finish, it is possible to replace a large number of standalone software solutions with a perfectly integrated system. Since complex interface problems are eliminated, all work processes can be carried out in one user-friendly system.

James Murphy, satisfied with the cooperation, states: "We have faced numerous challenges during the commissioning of the plant including Covid and we recognise the commitment from Progress Group to deliver a state of the art facility for the production of multiple precast products, which will service the Irish and UK market." ■

CPI tv

Video about Kilsaran Precast in Kilcullen

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## FURTHER INFORMATION

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