

Masa GmbH, 56626 Andernach, Germany

Plasmor sets the course for quality, service and innovation

The exit of the United Kingdom from the European Union and its consequences have been preoccupying residents in both the United Kingdom and the European mainland for a long time. For companies with long-term business relationships tied to the United Kingdom, the list of open questions about Brexit and its consequences seems to be endless. Most experts predict Brexit to adversely affect the British economy raising fears and uncertainty across the United Kingdom. The Plasmor Group of Companies was founded in 1959 and has grown to be one of the largest independent concrete products manufacturers in the UK and appear unfazed by the current political turmoil. With typical British composure, the family business is concentrating on a future-oriented expansion of its production facilities. For Plasmor Ltd. quality, service and innovation in their production lines take precedence over Brexit.

With this in mind, Plasmor is constantly looking for new ideas and positive influences and does not hesitate to connect with organizations located in the European mainland to exchange information and past experiences. As a highly successful private manufacturer of blocks, pavers and kerbstones with several production sites throughout Great Britain, Plasmor relies on the expert knowledge of the German engineering com-

pany Masa GmbH, whose plants, among others, are operating in Widnes and Knottingley for many years.

In 2015, the first appointments took place about an additional state-of-the-art concrete block production plant in Knottingley. The engineering team from Plasmor approached Masa with the functional design layout and specification of their new production plant and how they wanted it to operate. From previous projects between the two companies Plasmor was aware Masa was greatly open to listening to and appreciating its customer's needs; the first experience of this was their first Masa plant delivered in 2006 at the Widnes site and subsequently at this plant following a major fire. The fire caused significant damage at the plant destroying the control system and the power cabinets. Within a very short time, the "brain" of the plant was rebuilt, programmed and installed, thanks to the unbureaucratic support of the Masa team. With an eye to the future Plasmor again placed its trust in Masa and appointed them as their partner in the new plant in Knottingley to manufacture a wide range of high-quality products.

Continuous investments in new product developments and the equipment used to produce them are core values forging Plasmor's sustained growth. A great commitment to research



Board of Directors of Plasmor Ltd. (from left to right: Julian Slater, Jim Marshall, John Swain and Neil Marwood)

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Masa covers the complete range of machinery and ancillary equipment for the building materials industry: Batching and Mixing, Concrete Blocks/Pavers, Kerbstones, Concrete Slabs, Sand Lime Bricks and Autoclaved Aerated Concrete (AAC) Products.

All technical solutions are individually planned, designed, adapted and realised for each customer, resulting in one supplier and one individual contact person.

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and development brought forth by their own internal specialists and the use of state-of-the-art technologies has made the company a pioneer in the building materials industry. By focusing on responding to customer needs, Plasmor aims to define and deliver new standards in conjunction with ever changing market demands to create the highest level of customer satisfaction. These principles have been carried out without compromise by both Plasmor and Masa, during the entire planning, conception and implementation phase of the project.

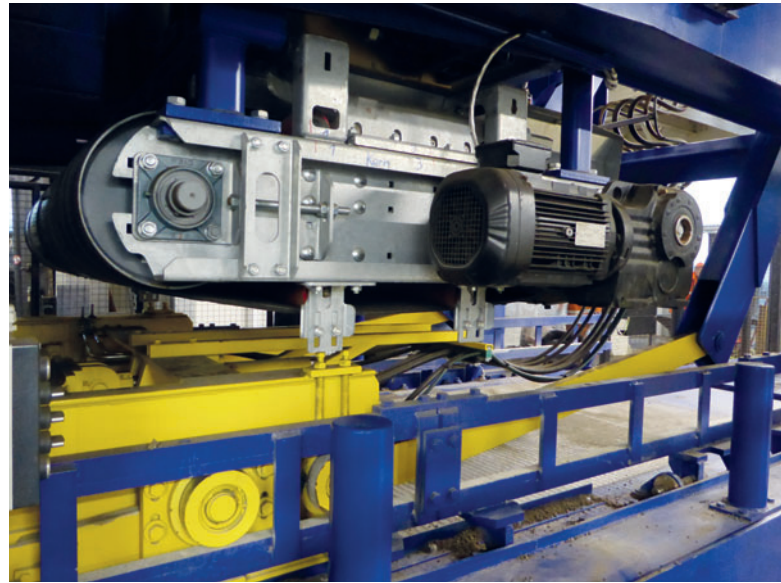
The way Plasmor lives out its company values is admirable. A great example can be found in the dosing and mixing area of the new plant. The conception, layout and construction of the large silo plant with a multi-chamber system for raw materials did not leave Plasmor's hands. The used colour-mix device was developed in-house, with only the concrete mixers being purchased externally. Besides the extensive equipment, the programming of the dosing and mixing plant was also carried out by Plasmor itself. The responsible project manager of Masa was impressed by the scope of this in-house project, which was implemented with great care.

Masa XL 9.2 sets the pace

The cycle time of the sophisticated production plant is determined by a Masa block making machine with amplitude-controlled vibration. The high-performance machine type XL 9.2 with its additional S-Upgrade (fast execution) has been optimally designed for a reliable, automatic production of



Masa block making machine XL 9.2



Optional add-on-package: dosing belt

products with and without face mix concrete. The vast diversity of the Plasmor product range is much more extensive than a typical producers product portfolio. It is made up of blocks, pavers, kerbstones and retaining wall elements. The manufacturing of these products takes place on production pallets made of steel.

During the inception of the factory, both current and future markets were taken into careful consideration when selecting the machine and the different options to equip it with. Masa technology makes it possible.

In addition to the heavily equipped standard configuration of the XL 9.2, the machine at Plasmor further distinguishes itself from other machines with optional add-on packages such as dosing belts, laser level sensor, pneumatic filling box scrapers and a smoothing roller.

The freshly manufactured products are quickly transferred from the servo-controlled production pallet feeder to the synchronized lowering device, which is executed as a v-belt conveyor. A fully electrical walking beam conveyor transports fresh products down the line.

During production, every day, each batch of product is under constant and stringent surveillance by trained quality control operators. A pre-determined sampling regime is employed with rigorous quality checks being carried out in Plasmor laboratories located on-site. The tests conducted include dimensional accuracy, strength, density, moisture content and weight. In addition to extensive tests in the laboratories, the weight can already be determined during the production process on the wet side.

With Plasmor's diverse product portfolio, a flexible design in the production plant that was able to efficiently and effectively produce and accommodate these different types of products needed to be taken into consideration.

One feature to address this is the intermediate finger car, which is integrated after the elevator. With this investment, a possible organisational bottleneck in the overall process was avoided in the plant design.

The adaptability is embodied in additional components and areas around the plant. The finger car picks up the fresh products from the intermediate finger car and stores them in the curing rack system. After the curing process, the loaded production pallets will be handed over by the finger car into three further intermediate finger cars. The choice of intermediate finger car takes place automatically in the most logical way. To enable this, the priorities were set in the program, again under the headline flexibility.

Rotho big chamber with ProCure 2.0 concrete curing system

The curing system, supplied by Rotho, is designed with 22 rows of racks for a capacity of 8712 production pallets. The choice of material was orientated to the highest quality demands. This led to a rack system which is entirely made from stainless steel. The ProCure heating & humidification system, which is also installed, includes pipelines made of aluminum as well as hot air generators made of stainless steel and was designed according to the latest plant design.



Curing plant



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A special feature of the ProCure system is the dividing of the big chamber into a total of four heating and humidification zones. In these climate zones, the chamber temperature and humidity can be controlled independently without the need to install partition walls seen in conventional systems. This individual treatment creates a very uniform chamber climate, regardless of whether products are freshly stored or are already cured.

With speed to the destination: Line I

Due to the huge variety of products and the continuing required flexibility in production planning, the project was designed with two individual and completely independent operating dry sides and remodelling lines. In principle, these two areas pursue different objectives, but depending on production requirements, they can be freely combined in the complete process.

Line I is focused on speed. This line is mainly designed for wall building materials to achieve the shortest throughput time. In the first step, the products are detached from the production pallet. Afterwards, the layers are centred and placed on remodelling line I to generate the final size to transport the products. Subsequent to these process steps, the cuboter creates the cubes. In this area, the four-sided centring basket is equipped with a lifting device, which additionally enables the doubling of two layers. The remodelling line placed in line I was an upfront challenge to design and program due to its unique capabilities. The products are shifted from the return transport to the remodelling line in layers. The ingenious remodelling device changes the size of the layers in two axes.

The adjustment of the size of the layers is necessary for Plasmor: The remodelling line enables smaller transport pallets for the easiest handling by the end customers. Common remodelling devices are designed to increase or decrease the

layers in X-direction. At Plasmor, the layers are also varying in Y-direction. In addition to adapting the layer size, this device can create void layers. All these functions enable a significantly higher flexibility compared to conventional remodelling units. To guarantee the function and reliability of the special and comprehensive unit, Masa thoroughly examined the new remodelling unit prior delivering it to Knottingley. The complete equipment was assembled in the production hall in Andernach and subjected to extensive functional tests.

To cube the products, the layer shifter is used again. The special feature of the two clamping baskets, next to the integrated horizontal turning device are the shared tracks. The mechanical decoupling of both baskets embodies a smooth transition and enables an overlapping of the areas of interaction.

The described arrangement of the line enables Plasmor to provide the cubes with or without transport pallets, although cubes with void layers are the preferred solution.

Premium look for superior products: Line II

While line I of the dry side is to transport the cured wall building products as quickly as possible to the final take-off point of the complete plant, line II is all about high-quality pavers with a superior surface. The finger car transfers the cured products to intermediate finger cars. This concept helps to compensate possible bottlenecks and waiting times in this section of production. From the intermediate finger cars, the production pallets are handed over to the lowerators, which drops them down on the return transport in cycles.

The walking beam conveyor of line II transports the products to variable take-off points, depending on requirements. This means, the self-sufficient remodelling lines I and II as well as the surface treatment line can be served from this walking



Visualization



Remodelling



Surface treatment

beam conveyor. In the surface treatment line, the products are given their unique and finished character by various processing machines made by FC Sonderkonstruktion GmbH.

Depending on the chosen path through the surface treatment lines a vast array of surface finish can be created: the edges and corners of the stones can be broken to achieve an antique look, or textures similar to shotblast or ground finish. The intensity of each process is adjustable and can be performed after a very short curing time, which gives another special feature of the treatment processes.

The value adding line runs completely in dry operations. The arising dust is extracted by a high-performance filter.

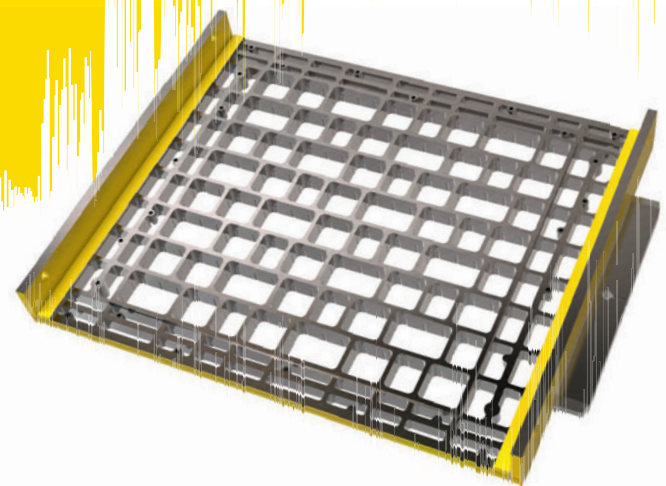
After passing the various processing steps, the layers will be handed over to the cubing area.

Next to the inline feeding from the walking beam conveyor of the return transport, the feeding of the value adding line can be done offline as well. The required equipment is also supplied by Masa. The complete cubes with transport pallets are drafted on a roller conveyor. The cube will then be conveyed to the take-off position of the layer shifter. It takes single layers of the cube and places it on the infeed conveyor of the surface treatment line. After reloading of all layers, the empty transport pallets are outwarded by a liftable chain conveyor in combination with a roller conveyor to a transport pallet stacking device. This transfers the completed transport pallet stack back to the take-off position to remove it by forklifts. The option of feeding the products to the finishing line inline and offline gives Plasmor the maximum flexibility at this point.

First impression lasts

The second remodelling line and corresponding cuber operate in a similar fashion as they do in the first plant area, with the cubing lines I + II being designed almost identically.

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Handling of products

Each of them consists out of a precisely coordinated roller conveyor system for complete product cubes. Furthermore, various packaging systems are installed on the individual roller conveyor modules. The second cubing line is equipped with a top sheet dispenser to protect the surfaces of the high-quality pavers. Horizontal and vertical strapping units secure the cubes and ensure proper storage after the cubing process in line I and the top sheet dispensing in line II. A subsequent hood stretching machine at each line covers the cubes the final protection against external elements with a robust stretch foil. The roller conveyor module underneath the hood stretching machine is additionally equipped with a turning device, an additional successful implementation requested by Plasmor. Initially, this requirement seemed to be challenging in terms of design and control technology, but the developed solution with a 90° turning device exceeded the expectations. The finished cubes stand out through perfect packaging. There is no question that the first impression of the Plasmor product range already evokes positive reactions. These associations should also arise at cubes with void layers instead of transport pallets. The highest priorities while loading these cubes onto trucks is the continuous view of the Plasmor logo during transport and the integrity of the foil remains strong even after the strenuous loading process. This is all ensured by a flexible horizontal rotation of the cubes by 90° before the actual packaging with the branded foil.

The keyword “flexibility” is an essential part of the entire corporate philosophy. In conjunction with production, the delivery of products across the country is encompassed by this philosophy. Translift Freight Ltd., a member of the Plasmor Group of Companies, supplies its customers with a modern, professional and highly efficient fleet of crane-off-load block delivery vehicles. Plasmor customers in the South of England and London are serviced by two distribution depots which are supplied daily by a unique rail freight system using Translift's own specially converted rail wagons. The total fleet of over



Cubing of the finished products

200 vehicles and 100 rail wagons are serviced on site at dedicated road and rail fleet workshops.

Sophisticated and proven: The Masa production pallet buffer

The production, processing and finally packaging of the concrete blocks and pavers by the extensive equipment leaves nothing to be desired. Next to these essential sections in the plant, the intermediate storage and return of the empty production pallets to the machine is an extremely important part of the production plant. The connection between the two return transport lines and the machine is well thought out and solved with a proven Masa standard system, although it is considerably enlarged in this situation. One production pallet lowering and collecting device at each return transport line collects four empty production pallets. The grab with a carriage, lifting and lowering device and 2- side clamp basket with turning device is installed on an approximately 18 m long tracks and enables the outward and inward transfer to five designated buffer places. The temporary storage of up to 1080 steel production pallets provides the entire plant with sufficient time for maintenance work on the machine or on dry side I or II which can be carried out within a defined time frame without creating additional downtimes. The pallet buffer compensates for the variation of different products cycle times on the block making machine and the dry sides I + II. While the machine typically produces products at high speed, the lines I + II operates at their own speed. This all helps to run stringent quality controls without losing production time.

Team spirit – the key to success

Plasmor and Masa are looking back on a completely successful project planning and realisation. The given technical specifications, new ideas and contemporary solutions were

individually discussed between both parties and brought into fruition in the new plant. At Masa, the project posed great challenges for those involved, which included a team made up of advisors, project managers, designers and programmers. The highly customised design of the plant in Knottingley had many special requests and tasks to take into consideration. These challenges were successfully met through excellent cooperation between the team in Andernach. Masa was able to plan, design, build, assemble and commission an ultra-modern block making plant in a class of its own. ■



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