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Infraset puts a further block making machine into production

In spring 2010 Masa GmbH received an order from the Infraset company to supply a complete block making machine to South Africa. This is Infraset's second Masa machine following the first in 2004. Infraset is a business unit of the Aveng Group, which operates globally as a construction group and is involved on top of that in mining and steelworking. Infraset supplies the most diverse products in the 'landscape products' segment, e.g. paving stones, roofing tiles, masonry materials, railway sleepers, etc. The manufacture of decorative paving and masonry materials has been expanded with the new works in the Johannesburg region of South Africa. The reasons for the expansion were an intensified demand on the part of customers for high-quality products, which could no longer be covered by the first plant alone. Due to this fact, Infraset decided to expand production in order to be able to manufacture large numbers of high-quality concrete products.

■ Peter Sommer, Masa GmbH, Germany ■

The main products are paving stones of all kinds in various colours, multicoloured stones, washed paving stones and other garden construction products. The manufactured products meet the very high quality requirements. Due to the excellent experiences with Masa with the first block making machine, it was a simple decision to purchase a Masa plant of the type XL 9.1 again. Masa therefore supplied the second plant for Infraset, from the mixing and dosing plant to the finished product.

The mode of operation of this modern concrete block making machine is briefly described below:

Mixing and dosing plant

The dosing plant is fed with material from a total of six bulk silos. The various raw materials are weighed via mobile scales (batching scales) and afterwards poured directly into the mixer elevators. Further components such as cement and other additives are fed to the mixer via screw conveyors. The quadruple dye dosing unit doses powdered dyes into the mixer according to the recipe. Special scales are used for weighing liquid additives.

The Masa high-performance mixers of the types PH 1500/2250 and PH 200/300 produce very good concrete qualities of all quality classes with short mixing times. A particularly homogeneous mixing effect is achieved by compulsory mixing using the counter-current principle with mixing tool movement at several levels. These practically proven plants excel because of their energy efficiency and low maintenance requirements. Water dosing is completely automatic.

A virtually unlimited number of mixture recipes can be developed and stored. The Masa mixing plant controller is extremely flexible and displays the processes in a clear fashion. After mixing, the concrete is transported by a bucket track system to the concrete silos of the block making machine.



Mixer frame with Masa PH 1500/2250 and PH 200/300 horizontal compulsory mixers



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Batching scales



XL 9.1 block making machine

Colourmix production

Infrasiet wanted a flexible and modern plant, in particular for facing paving stones with tinted, multicolour surfaces (colourmix). For this purpose Masa supplied a system with which different dyes can be fed to the facing bunker of the block making machine via various intermediate silos with discharge belts. The advantages of this are that the production has a high repeatability and that various shades of colour can be achieved in each production cycle with all of the dyes involved. The intermediate silos are fed via the bucket track.

Block making machine

As in 2004 this new works had to fulfil the following conditions:

- The manufactured products meet the very high quality requirements.

- Paving stones can be produced in the most diverse versions, colours and shades.
- All products for garden and landscape construction can be manufactured.

As with the first block making plant, the Masa block making machine type XL 9.1 was selected once again, which likewise produces on steel production pallets measuring 1,400 mm x 1,100 mm x 14 mm.

The XL 9.1 block making machine is a stationary, fully automatic universal block making machine for the mass production of concrete blocks made of both lightweight and heavy concrete and is the top model in Masa AG's range of block making machines. The machine consists of a three-part machine frame, the centre section with vibrating table, and the core and facing concrete filling sections. These filling sections can be opened separately, so that the machine is much more accessible for cleaning and maintenance.

Technical characteristics of the XL 9.1

- Machine is of a particularly heavy, stable design (Total weight over 40 t)

- Extra-long guide bearing on the tamper and mould.
- Fully automatic mould change (< 10 minutes) including automatic vertical adjustment of core and facing filling sections
- Manufacture of building blocks and dry wall bricks with precise heights.
- The machine functions are carried out by means of highly-dynamic, maintenance-free proportional valves with integrated electronics.
- Machine control is carried out on a decentralised basis by means of Profibus.

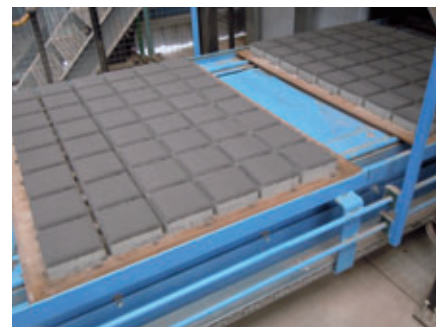
The noise emissions from the machine hydraulics are reduced by the Hydraultainer concept. For this purpose, the machine hydraulics are integrated into a specially adapted 40' sea container. Depending on the other measures employed (electrically driven transport systems and packet assembler), a significant reduction in noise emissions can be achieved. Masa is catering for the ever increasing trend towards noise reducing measures with this standard concept.



Transfer table



Air circulation system for optimum hardening of the products



Paving stones on dry side



Packet assembler with servo clamp

Product handling

The concrete blocks produced by the machine are transported to the elevator by means of a lowering device and a lift and carry conveyor. A washing plant was integrated into wet side transport system in order to wash the surfaces of paving stones in the fresh state.

The concrete blocks are stored in the rack system for hardening by means of a fully-automatic transfer table, which is rotatable. The rack system was implemented by the customer as a closed system with an air circulation system supplied by Masa. This ensures optimised hardening with a minimum expenditure of energy.



Return transport with 4-sided centring and packet transport



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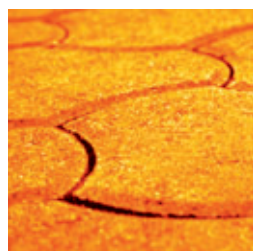
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Lift and carry packet conveyor with station for vertical strapping without transport pallets



Powertainer for controllers

The blocks are removed from the rack system to the dry side after hardening. For this purpose, the transfer table transports the dried blocks to a lowerator. From there the layers are taken by the return transport with 4-sided centring to the packaging system, where the blocks are assembled fully automatically into block packets. Return transport is by a lift and carry conveyor. The drive is in each case provided by a geared servo-motor.

The basic structure of the packaging device consists of a portal frame of robust profile steel. The warp-resistant chassis as well as the lifting and lowering movement are each driven by toothed belts and geared servo-motors. The swivelling, suspended grip and clamp device is an electrically driven four-sided clamp (servo-clamp).

After packaging, the packets are strapped horizontally and vertically without transport pallets. The packaged products are transported via a lift and carry packet conveyor with connected roller conveyor to the outdoor area. They are then taken by fork-lift truck to the storage yard.

Control and operation

The plant is controlled by a controller developed by Masa on the basis of the Siemens S7, with PC and touch-screen monitor. As is usual for Masa, the control cabinets of all controllers are pre-installed in a 'powertainer', a specially adapted 40' sea container.

This is advantageous in that the installation of the plant is accelerated and the control cabinets are housed protectively in a climatized room.

Profibus systems network the decentralised S7 plant controller. Functions can be selected and data input directly using the colour display touch screen. The visualisation software supplied has simple graphical function displays, a user guide and unlimited recipe management. The built-in statistics program records all operating data, which can be transferred to external PCs.

Masa safety system

During the project discussions with Infraset it became clear once again that Masa's safety philosophy is the right one and is welcomed by most customers. Masa supplies all safety devices from one source and does not rely on work to be carried out by the customer. At Masa, safety is not a tiresome item that has to be fulfilled; it is discussed within the company and implemented equally worldwide. Safety is also very important to Infraset – work safety in conjunction with an operable plant was the highest priority in the discussions. Therefore, as is usual worldwide, Masa supplied all safety devices (protective fences, light barriers and power-off systems), which are decentrally controlled via a separate safety PLC. In this way it was possible to define individual safety areas together with the

customer and the most diverse emergency stop buttons are reachable via the shortest routes inside the plant.

Conclusions

Infraset will successfully continue down the road it has taken in future with a versatile, high-quality product range.

That is guaranteed by the plants supplied by Masa, which are designed and built to meet the latest technical criteria and safety requirements for a concrete works. With the Masa plants I and II, Infraset thus has two of the most modern and most effective block plants in South Africa. ■

FURTHER INFORMATION



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