Masa GmbH, 56626 Andernach, Germany

Diton places its trust in the same plant manufacturer again for its third block-making machine

In winter 2010/2011 Masa GmbH received an order from the Diton company to supply a complete block-making plant to the Czech Republic. This is Diton's third Masa machine following the first in 2005 and the second in 2007. As special highlight and in contrast to the previously supplied plants, the third generation is equipped with "FAST - Factory Automation System Tool" – Masa GmbH's new plant control software. This software provides even better assistance to the operators in the control of the plant.

External view of the Diton Paskov works

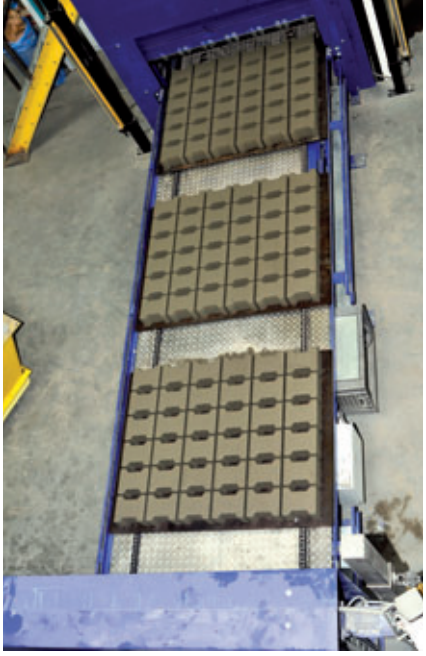
Diton is one of the leading Czech manufacturers of concrete products. These include concrete goods such as paving stones, kerbstones, masonry blocks and palisades, as well as products for underground and road construction such as concrete pipes.
The constantly growing demand on the part of customers for high-quality products could no longer be covered by the two existing Masa plants. For that reason the Diton company decided to expand production in order to be able to manufacture an additional large number of high quality concrete products with a third production line.
Due to the consistently positive experiences with Masa with the first two block-making machines, the company decided once again to buy a Masa plant of the type XL 9.1. Paving stones of all kinds in different colours and multi-coloured stones are primarily manufactured on the new plant. Of course the products meet all the very high quality requirements of the Czech market.
Masa supplied a complete production line to Diton; its mode of functioning is briefly described below.

Mixing and dosing plant

The material is fed to the dosing plant via a bucket conveyor to various material silos The raw materials are weighed via mobile scales and afterwards poured directly into the mixer elevators via conveyor belts. Further components such as the binding agents are fed to the mixer by screw conveyors.
The Masa PH 2000/3000 and S 350/500 high performance mixers produce highest concrete quality for all quality

Twister S 350/500 facing concrete mixer

XL 9.1 Fast Version



Wet side transport in the form of a chain conveyor

classes with short mixing times. The large mixer for the production of the core concrete works according to the counterflow principle with mixing tool movements at several levels. This results in even and homogeneous mixing. The facing concrete mixer works with an inclined rotating trough. This way the material, the dyes and the cement are homogenised even better to a concrete and the quality of the facing concrete is improved.

These practically proven plants excel because of their optimised energy efficiency and low maintenance requirements. Water dosing is completely automatic.

Block making machine

As in the previous years, the new works had to fulfil the following conditions:

- The manufactured products meet very high quality requirements.
- Paving stones can be produced in the most diverse versions, colours and shades.
- All standard 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 supplied is the XL 9.1 in the fast version, i.e. up to 6 cycles of paving stones can be manufactured per minute.

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.

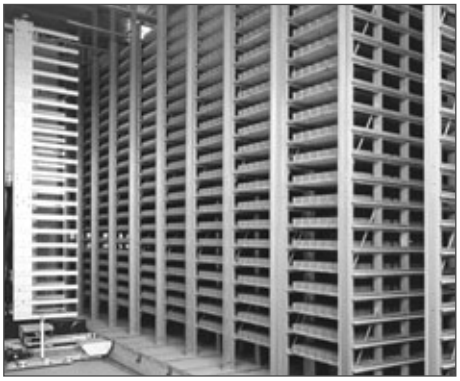
Transfer table and rack system

Pre-lift in the form of a mobile buffer between the transfer table and lowerator

HS

Curing chambers

for the concrete block industry



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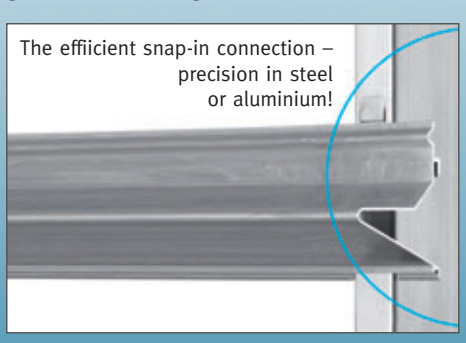

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Detailed view of a four-sided centring unit with servo drives

Return transport with four-sided centring and packet assembly

Technical characteristics of the XL 9.1

- Particularly heavy, stable machine construction (total weight over 40 t)
- Servo vibration with automatic adjustment of frequency and amplitude
- 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 Hydrautainer concept. For this purpose, the machine hydraulics are integrated into a specially insulated 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 concept.

Product handling

The concrete blocks produced by the machine are transported to the elevator by means of a lowering device and a chain conveyor. The concrete blocks are stored in the rack system for hardening by means of a fully-automatic transfer table, which is rotatable.
The shelving units was designed in the form of a closed system with recirculating air equipment. This ensures better hardening with a minimum expenditure of energy.

The blocks are removed from the rack system to the dry side after hardening. To this

Packet transport to removal by fork lift truck

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Pallet packet gripper for putting the production pallets into and taking them out of the pallet store

end the transfer table transports the dried blocks to a mobile buffer rack and from there the products are taken to the lowerator. The layers are taken by the return transport with 4-sided centring to the packet assembler, where the blocks are assembled fully automatically into block packets. The return transport is likewise executed as a chain conveyor.

The basic structure of the packeting 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 servomotors. The swivelling, suspended grip and clamp device is also an electrically driven four-sided clamp (servo-clamp).

Before the packets are formed, a pallet feeder places the corresponding transport pallets on the packet transporter. Once the packets have been assembled, the products are transported by a packet transporter to the fork-lifter removal point.

The empty production pallets are stored in a board buffer before the return transport. This enables different cycle times on the wet and dry sides to be compensated.

The plant is controlled by a controller developed by Masa on the basis of the Siemens S7, with PC and touch-screen pr TFT monitor. As is usually the case with Masa, all controllers are preinstalled in a Powertainer. This is a specially prepared 40 ft sea container. This is advantageous in that the installation of the plant is accelerated and the control cabinets are housed protectively in a acclimatised room.

Plant controller with the new FAST control software

The visualisation software is a modularly structured software for the uniform operation and visualisation of the components. It encompasses the following tools:

Visualisation

With the help of the visualisation software it is possible to monitor the block-making machine on the PC. The operators can orient themselves very easily by the use of images generated by the Masa 3D-construction program.

Product data management

The product management software controls the production plant via product recipes. This means that all plant parameters are stored in a recipe for each product. This includes, for example, mixture recipes, machine parameters and finger car or ring plant settings.

Thanks to the modular structure of the software, customer-specific requirements for the software can be integrated. As a basis Masa supplies a product data management system with up to 200 recipes, basic operating data acquisition for the logging of consumption and statistical data, password protection and translation into the respective national language.

Depending on customer requirements, these basic components can be supplemented for example by:

- Comprehensive operating data acquisition and management of various process data
- Unlimited recipe input
- Comparison of recipes for different products
- Mould management and allocation of moulds to recipes
- Automatic recipe change in the complete plant
- User administration and allocation of functions to different password levels
- Different language versions
- Connection or forwarding of the plant data to external interfaces

Conclusions

Diton will successfully continue down the road it has taken in future with a versatile, high-quality product range. That is guaranteed above all by the plants supplied by Masa, which are designed and built under to meet the latest technical criteria and safety requirements for a concrete works. With the Masa plants I, II and III, Diton operates one of the most modern and most effective concrete block works in the Czech Republic.

FURTHER INFORMATION

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