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Support systems and polyurethane moulds for state-of-the-art wetcast manufacturing

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Wasa Compound GmbH & Co. KG, 98617 Neubrunn, Germany

Support systems and polyurethane moulds for state-of-the-art wetcast manufacturing

David Werning, Wasa Compound GmbH & Co. KG, Germany

A daily output of more than 2,000 m² concrete products is possible with a cutting-edge, fully automated wetcast system. Popular products here are high-quality terrace slabs as imitation natural or artificial stone, facing blocks for façades or small-format replica paving blocks. Wasa has accompanied and strongly supported the development of mould production for these wetcast applications over the past decade. A detailed report on mould solutions for automatic wetcast lines was published in CPI issue 3.2021.

Efficient production lines also need a transport medium in addition to high-quality polyurethane moulds. From its extensive portfolio, Wasa combines its Woodplast production boards with its polyurethane moulds to create an effective system for manufacturing wetcast concrete products. Wasa Woodplast production boards have been successfully employed as self-stacking pallets in the wetcast industry for more than 10 years. The Wasa Woodplast support system is optimally adapted to the requirements of customers and system suppliers alike.

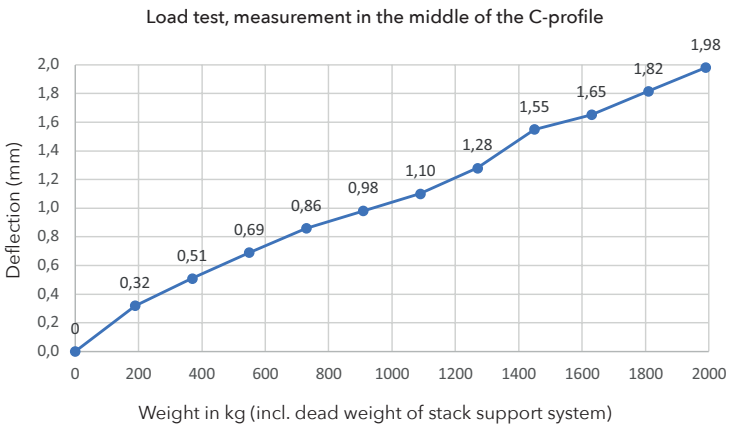
The requirements for a support system specifically for the wetcast industry are:

- Sophisticated interlocking system for centring individual boards in a stack and as protection against displacement during transport
- In a pallet stack, the lowest board carries the complete load of the concrete goods, moulds and system weight
- Permanent securing of the entire assembly with bolts
- High abrasion resistance of the board underside
- Only one-sided use of the boards. The boards cannot be turned over due to the mounted feet or supports
- Maximum occupancy area despite mounted feet or supports
- Level, closed surface
- Load application in longitudinal and transverse directions
- Low dead weight in relation to the load case
- Easy assembly of moulds and accessories

Wetcast circulation system and support systems handling

An assembled unit consisting of a Wasa Woodplast support board, feet and free-standing polyurethane mould is delivered already completely pre-assembled. Board occupancy

Practical re-adjustment of the support and support width in the curing chamber when a stack is fully loaded above a total weight of 2,000 kg. The lowest board in the pallet stack bears the complete load of concrete products, moulds and the system weight



Graph illustration and findings with the readjustment. The deflection of 1.98 mm at full load was measured after 48h on the lowest board

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Assembly group consisting of Wasa Woodplast support board with feet and free-standing polyurethane mould. This 3 cavity mould is screwed to the support board using metal sleeves. The position of the metal sleeves facilitates demoulding the concrete blocks with a vacuum robot. The circumferential mould lip prevents concrete from running under the mould

configurations, individual filling positions and the demoulding technique are discussed and planned in advance with the customer using 3D software. The mould layout and board configuration are adapted to system requirements. Concrete producers can put the system into operation immediately without any time-consuming assembly work.

After the moulds are filled with a special casting concrete, several Wasa Woodplast support systems can be combined to form a pallet stack. A complete stack can contain up to 20 support boards with concrete products and moulds. The total weight in this case can exceed 2,000 kg per stack. The lowest board carries the entire load and the C metal profile serves ideally as a lifting and gripping surface for handling in the stacking unit. The complete stack is transported into the curing chamber as soon as the specified stack height is reached. The concrete curing time as well as the retention time are recipe-based and computer-controlled. The support systems and moulds are equipped with RFID chips for tracking in the facility. Board occupancy, volumes and assembled mould properties can be stored in the master data using the system software. Completed production cycles can be traced at any time.
The pallet stack with its hardened concrete products is taken from the curing chamber by the stack transfer unit and transported to the destacking unit. Individual support boards are indexed in the destacking unit to the demoulding robot via a pawl conveyor. The polyurethane coating of the support boards glides on the steel rails of the pawl conveyor as it travels.

The operational distance covered during daily use adds up to more than 50 kilometres over 10 years. Wasa relies on a special polyurethane coating in Shore hardness D70 to prevent the steel pawl conveyor from grinding into the board underside. Uncoated production boards made of wooden materials are unsuitable for this application due to the higher friction between the steel and wood surface.

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A freshly filled 4 cavity mould is being transported to the stacking unit via the pawl conveyor

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Stacking unit on wet side. The complete stack is transported into the curing chamber as soon as the specified stack height has been reached

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Fully automated handling system for drycast production. The fresh concrete products are stored in a curing chamber under climatic conditions specifically for cast concrete products

In the following stage, the hardened concrete products are removed from the moulds. Two main techniques for demoulding concrete products in automatic wetcast lines are predominantly found in the wetcast industry: demoulding via a robot with vacuum suction or rolling out the concrete blocks using a roller. The latter is primarily employed with small-format concrete products such as facing blocks for façades.

When it comes to cost-effectiveness and sustainability, the Wasa support system can lay claim to many years of practical experience. The solid wood core used also comes from regional and sustainable forestry. In the past, solutions in the form of solid steel structures were also used in addition to the Wasa Woodplast support system. However, steel structures have to be regularly oiled against corrosion in a concrete production facility but this, of course, is not necessary with a support board. The Wasa system is also outstanding in terms of the ratio of its own weight to the load-bearing capacity possible. Moulds and accessories can be mounted quickly and easily with threaded wooden bolts. In the event of damage to the surfaces, e.g. due to the replacement of old moulds, the assembly holes can be permanently repaired by the customer himself using a special repair kit. ■

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Kuka robot with flexible vacuum suction cup. Unlike conventional drycast manufacturing, the later block surface in wetcast production is in the mould base on the underside. These hardened pool slabs will be turned and packaged on the packaging line on pallets with spacers

FURTHER INFORMATION

WASA Compound GmbH & Co. KG
Meininger Straße 9, 98617 Neubrunn, Germany
T +49 36947 5670, F +49 36947 56721
wetcast@wasa-technologies.com
www.wasa-technologies.com