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Flexible polyurethane liners for the design of textured
precast concrete elements and façade elements

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

Flexible polyurethane liners for the design of textured precast concrete elements and façade elements

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

Ambitious construction projects are evolving from classic in-situ concrete formwork to prefabricated and customised precast concrete elements. Realising a vision of architects and designers increases the demand on the concrete builder right at the beginning of a project with the design of a suitable formwork or form liner. To meet these requirements, Wasa offers a comprehensive service from virtual 3D models to individually manufactured casting moulds and form liners.

Standardised / uniform data and common shared knowledge

In this context, Wasa creates a virtual, true-to-scale 3D model. The CAD model data can also be provided by the customer and seamlessly integrated into the Wasas CAD planning tool. By networking standardised data it is possible to display correlations on the screen in a short time and to test them in virtual environments. Many questions are clarified directly on the 3D model on the tablet or on the monitor.

All required data is linked to an assembly. From the assembly, work plans, parts lists for purchasing and other interfaces such as CAM programming of the CNC milling machines for the production of models and tools are controlled. The digital workflow opens up a new quality of communication, and language barriers can be reduced and broken down.

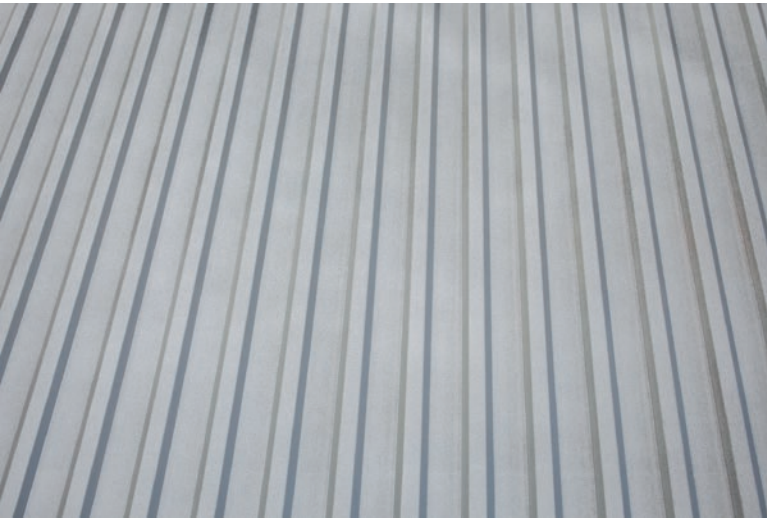
Wasa's different surface structures are organised into three categories. Standard form liners with different properties can be selected from the design of the Artcast, Stonecast or Woodcast series for concrete design. From sand-like surfaces to coarse quarry stone, the concrete builder has a very wide variety of possible structures at his disposal. Wasa's design is not limited to a two-dimensional surface. For instance, as required, lateral natural stone structures are modelled in the in-house model construction department to meet the design specifications. Today, the combination of traditional craft techniques and modern manufacturing methods makes it possible to realise complex and filigree three-dimensional models. For the implementation, Wasa can draw on extensive



CNC machining of PU block material, model dimensions 3,600 x 1,500 mm. The structure is milled into the block material by a state-of-the-art 5-axis portal milling machine.



Machining of the standard surface Wasa Artcast Stripe 2



The surfaces of the models are smoothed following the CNC machining. The models are given a micro-fine coating for a smooth and closed surface. Due to the matt surface, the release agent later adheres to the form liner evenly and homogeneously.

and long-standing experience from the wetcast sector (see report in CPI 03/2023).

For the production of the flexible polyurethane liners in the standard hardness Shore A65, Wasa Pur is used, which has already proven itself many times over. The two-component polyurethane specially developed for large-format liners and moulds is convincing due to its very good flow properties, long open pot life and the corresponding ease of processing. For a sustainable increase in the reproducibility of the polyurethane liners and moulds, Wasa does not use mineral fillers such as calcium carbonate or plasticisers in the polyurethane system. The resulting low system density of 1.12 kg/l gives the user up to 30% more mould volume compared to many common competitor products. Wasa chooses a layer thickness of at least 15 mm for the liner, which is very generous but uses the same amount of material in relation to the weight of the liner.

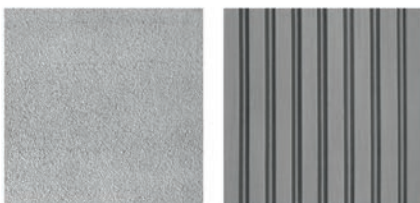


Retaining wall system by Easy Block from Austria. The peripheral structure of the corners and sides were modelled on the casting tool from a flat template, Wasa Stonecast Gneiss 3.

The increased layer thickness has a direct and positive influence on the tensile strength, form stability and reusability of the concrete form liner.

Wasa offers a water-based release agent for the easiest possible application. The new release agent Wasa Release is a development based on the Wetcast range. The ready-to-use emulsion is solvent-free and can therefore be applied micro-fine - for example with the help of a portable airless system. It is important that the form liner is wetted over its

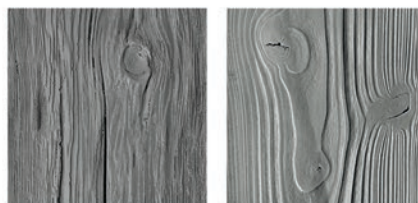
WASA ARTCAST



WASA SAND 1
300 / SN / 01

WASA STRIPE 2
300 / ST / 02

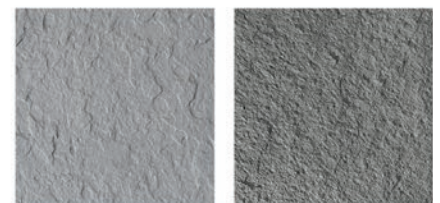
WASA WOODCAST



WASA OAK 1
100 / OK / 01

WASA TIMBER 2
100 / TB / 02

WASA STONECAST



WASA SLATE 1
200 / SL / 01

WASA GNEISS 2
200 / GN / 02

Surface examples, standard structure liners with different properties can be selected from the three categories Wasa Artcast, Stonecast and Woodcast



Wasa PUR is a low-viscosity two-component casting resin and is very suitable for large-sized moulds and form liners. For concrete manufacturers with their own moulds and formwork construction, container sizes from 7.5 to 1,000 kg are available.



Impression of a Wasa Precast form liner from a PU block model. The increased layer thickness of at least 15 mm has a direct and positive influence on the tensile strength, form stability and reusability of the concrete form liner.

entire surface. Before using the form liners for the first time, the release agent application should be repeated two to three times to saturate the absorbent and vacuum-forming PU layer.

The fine dosage of Wasa Concrete Release keeps overspray to a minimum. The consumption of the necessary amount of release agent is reduced and creates a better working environment for the user. In production, the release agent also has a caring property on the form liner and increases the alkali resistance to the concrete.

With its coordinated products and services for the precast concrete industry, Wasa offers form liners without limited reusability. In combination with the universally applicable Wasa Shuttering System, the concrete builder also has another solution for a modular formwork system of flat precast concrete elements.

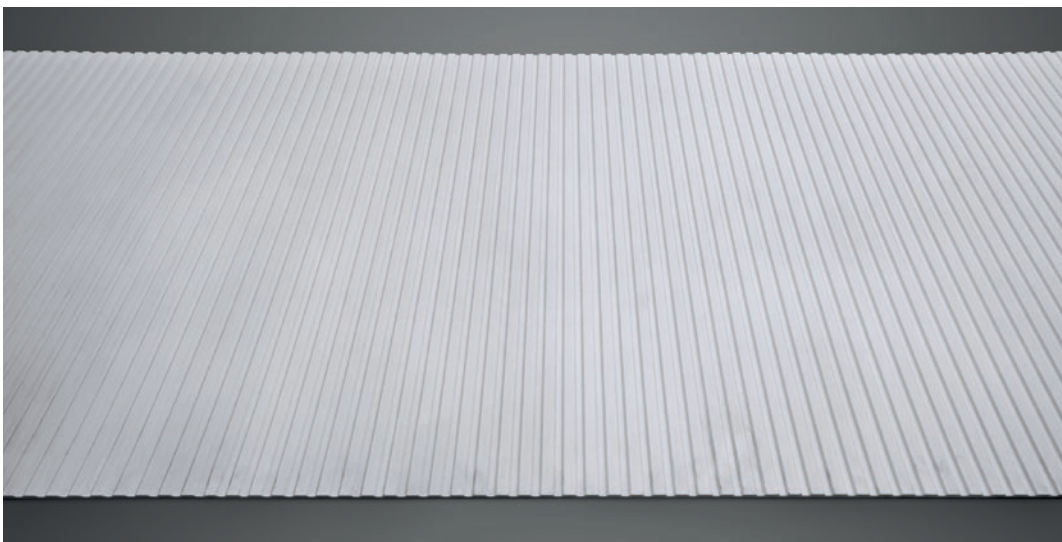
The special advantages of the system lie in the unrestricted choice of dimensions and thus the possible implementation of a wide variety of applications with a single system, from palisades to terrace slabs to precast concrete slabs, and the resulting savings potential in individual mould construction. A project report on Wasa Shuttering will follow in an upcoming issue of CPI.

FURTHER INFORMATION



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Ready-to-ship form liner in Shore A65, manufactured with Wasa Pur for a customer in Mongolia