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New generation of PUR wet cast moulds for current design trends

Today, artificial stone manufactured in the wet cast process are considered high quality design products. The trend of coarse natural stone imitations has changed to expansive, elegant and subdued concrete slabs. The manufacturers of such modern products are in competition with slabs from the ceramics industry, which has joined this trend. Thus the demands on concrete plants not only continue to move forward, but require all the necessities and use of ultramodern technology in contemporary mould construction. This is exactly where Wasa ties in with its many years of knowhow and sophisticated processing technology. The following contribution should point out key principles and raise awareness.

Model / master

A CNC-milled master in hard plastic is a prerequisite for an elegant concrete block product with minimally rounded edges and small joint. A previously scanned surface can be transferred to the master by CNC manufacturing.

Masters made from wood materials or materials with an open-pored surface are unsuitable. Wood materials adapt to the climatic conditions of the surroundings and tend to cup and warp. The masters are unusable in the expansion of production capacity for the new season and new models are needed.

In the worst case scenario, backup copies are not available and a special surface, such as wood grain, is already in product catalogs and advertised on the market.

Masters in materials with a density below $0.7 \text{ kg} / \text{dm}^3$ often have an open pored surface. This property will be copied by the PUR mould. The release agent can reach deeper layers of the polyurethane form. Poor demoulding of concrete blocks at the beginning of production is only one result.

Wasa pursues the path of in-house model building. From concept development to the master, Wasa uses the latest methods such as CAD/CAM programs, CNC milling and application technology from model building.

Polyurethane systems and PUR moulds

Three different hardness grades, measured in Shore A, have become established for use with concrete: Shore A45 (soft) Shore A65 (standard) Shore A85 (hard). Due to the European chemical regulation REACH, mercury catalysts in polyurethane systems may only have limited or no further use.



The Simcon Patio slabs from Kann look elegant and modern with a level surface



In keeping with the trend among wet cast products: here is the timber block step with fine wood finish from Greystone Ambient und Style

FURTHER INFORMATION

WASA

Competence
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Insight into the manufacturing of high quality wet cast moulds with machine and computer-controlled technology



Large-format self-supporting wet cast mould with cast resin-saving design

Especially old PUR moulds with the named mercury compounds are hazardous waste and must be disposed of accordingly.

There are numerous liquid polyurethane systems on the market. The systems have their applications in various industrial and craft sectors. Specially developed and optimised materials for wet cast moulds are needed for demanding use in the concrete plant. Machine and computer-controlled technology is required to achieve the optimal properties of a PUR mould. Compliance with the seven day curing time at 20 °C for cast PUR moulds must also be guaranteed.

Wasa produces mercury-free wet cast moulds with the world's latest technology in Neubrunn, South Thuringia. With the growing demand for quality and stability, a new generation of PUR moulds is being produced for the concrete industry.

Release agent

There are numerous release agent suppliers. Basically, a release agent for PUR moulds must be free of solvents. Solvents not only attack the polyurethane material and reduce mould stability, but contribute to increased solvent concentration in the ambient air and increased workplace concentration. Testing and approval of a release agent by the manufacturer of PUR moulds or liquid PUR components is imperative. However, the testing can only determine whether the release agent attacks the surface of PUR moulds.

It is not possible to determine the separation effect and influence on concrete quality. PUR moulds must not be used with different release agents. An interaction between the release agents cannot be ruled out. Interactions result in the deformation and shrinkage of PUR wet cast moulds.

Airless systems with drip-free, micro-fine atomisation have proven themselves when using release agents. Care must be taken that the spray nozzles function perfectly and are not clogged.

In consultation, Wasa refers to its extensive experience and discusses the most suitable release agent with the customer.

Conclusions

The importance of a high quality wet cast mould in the success of a new concrete product must not be underestimated. The investment in full size models is already neglected in product development due to saving costs. A PUR mould can only reproduce a concrete block as good as the previously selected template. The market trend demands straight, elegant products. That demands the use of complex technology and suitable polyurethane materials.

The points mentioned are a prerequisite for a predictable, smooth introduction of new concrete block products.

From practical experience, the service life of a PUR wet cast mould is 800 - 1,200 impressions with careful handling. This is shown by prior experience with thousands of successfully delivered KG PUR moulds that Wasa has sent to customers around the world. For the concrete worker, this can generate long-term competitive advantages, planning security and resource savings. ■