

Wasa AG, 64293 Darmstadt, Germany

The correct production boards for any circumstance

Wasa comes up with a broad range of production boards: from the softwood board to the coated wooden boards and the solid plastic board, everything is available from this full-range provider. Since the spring of this year, the portfolio was expanded by an additional type of production board, a holly chamber board with a honeycomb structure. Which production board is most suitable for whom and what should be considered in the selection of the correct board: the following report deals with these issues and examines the various types of production boards for their suitability for the particular product-dependent requirements in the concrete plant, while also taking individual quality requirements for the concrete goods into account.

■ Matthias Bechtold, Wasa AG, Germany ■

Wasa's philosophy has always been that of a full range provider: a manufacturer that does not restrict itself to a particular board type, but can offer its customer the optimal board for their particular applications, budget and requirements. This requires broad expertise, because the production of pinewood boards follows completely different rules than polyurethane coated boards or even solid plastic boards made from special high-performance plastic with glass fibre additives. Nevertheless, in Wasa's view, this extremely high expenditure for machines and personnel pays off because the individual board types are as specific as the requirements of customers in the concrete block industry are diverse.

Softwood boards made of pine and larch

The Wasa Softwood boards made from certified renewable pinewood or larch represent the lower end of the product range. Those who decide upon classic wooden boards receive a board that is distinguished, above all, by low initial investment costs. Of course, they have a significantly shorter service life in comparison to coated wood or solid plastic boards. While coated boards are used for an average of 8 to 10 years and solid plastic boards have already been used in production for over 20 years by some customers around the

world, wooden boards should be replaced by new boards after an average of three to five years. However, this is a matter of user judgment and there are users who have been producing blocks on softwood boards for 10 years. But high quality block products and a low scrap rate for blocks cannot be expected in the normal case.

The reason for this is simply the wooden raw material, which is subject to large stresses from variations in moisture content and changing temperatures. Thus, formation of open joints between the individual wooden planks over time can hardly be avoided - a phenomenon that will also be known from home by lovers of solid wood parquet with fireplaces or tiled stoves. While the parquet is installed beautifully everywhere, without joints, it tends to form joints in front of the fireplace or in spots where it is subjected to strong solar radiation. Humidifiers that are intended to restore the wood's natural moisture are recommended for good reason.

For the same reason, wooden boards in the block machine should always be kept moist. Furthermore, use of a release agent is often required to provide additional care for the wood. Those who neglect sustained spraying of the boards often see unpleasant cracks after only a few cycles, which result in lower quality block undersides.

Anyone who does not produce throughout the year, but shuts the plant down in winter, which is normal in the world's colder regions, must give consideration to proper storage of the wooden boards in winter. After the idle boards have all been sprayed, they must be removed from the curing chamber and stored in stacks with the individual layers separated by squared timber to prevent formation of mould due to stagnant moisture. Hardwood boards can be stacked on top of each other seamlessly, because hardwood contains an ingredient that prevents mould formation by natural means. The top of the stacks should be covered. If the winter break is not too long and the boards are reused as quickly as possible, this has a very positive effect on the board surfaces, because it prevents them drying out.

The reduction of vibration transmission in softwood boards over the course of their service life is also due to the natural raw material wood. While the boards still display good transmission values at the outset, they decline steadily over their service life. That affects the compaction of the blocks and consequently their quality.

In summary, it can be said that softwood boards are certainly less expensive to purchase at the outset, but are not necessarily more economical in the long term. They tend to be more suitable for the manufacturer of simple mass-produced goods and less suitable for the producer of high quality concrete blocks.

Polyurethane coated wooden boards

With the Wasa Woodplast® polyurethane coated wooden boards Wasa closes the gap that opened up due to the elimination of the hardwood boards that were very popular for many decades. Wasa ceased production of boards made from yellow balau and bongossi tropical hardwoods in 2010. One of the reasons for this was envi-



Wasa Softwood boards



■ Matthias Bechtold
Chairman of the Board of Wasa AG, Darmstadt, Germany

ronmental protection and the other was the constantly deteriorating availability of the raw materials, at least under economically interesting conditions.

The Wasa Woodplast is a board with a solid pinewood core and an approx. 2.5 mm thick polyurethane coating. On the short sides, additional galvanised steel C- profiles protect the boards from possible damage in the board magazine. The coating enables a joint-free board surface that guarantees perfect block undersides. Similarly, spraying with water is no longer necessary, because the wooden core is completely protected by the coating against external climatic influences and does not require any additional moisture supply from the exterior. The coated wooden board is therefore the method of choice for all those customers who shy away from the investment in solid plastic boards made from glass fibre reinforced plastic or a honeycomb structure (in both board types), but also do not wish to deal with the above-mentioned disadvantages of plain wooden boards. With service lives from eight to ten years, coated boards are in the range formerly offered by hardwood boards. In terms of price, they also occupy ranges comparable to the former yellow balau and bongossi production boards.

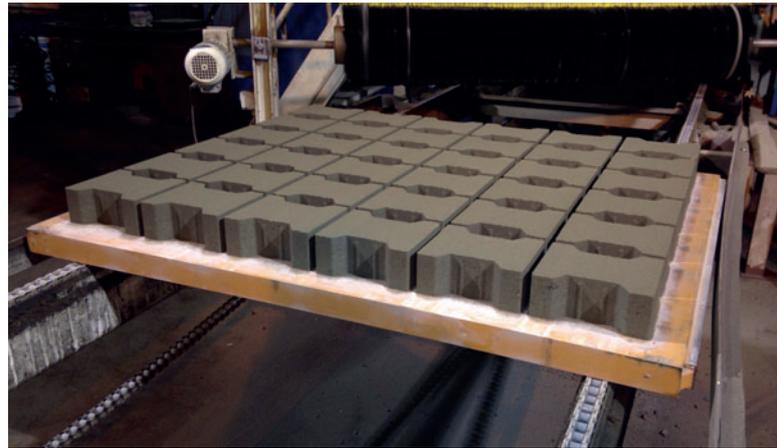
However, coated wooden boards generally always require special attention from the user. For example, the thin polyurethane coating can easily be damaged by hard material under the mould edges. Although minor damage to the plastic coating can be repaired by means of special repair kits that Wasa offers its customers. But this damage must first be recognised by the machine operator during the cycle. The board must be marked and then removed. Whether this always happens in practice seems at least doubtful. If damage is unnoticed and water penetrates into the wooden core, this can result in failure of the boards, because the wooden core begins to rot internally and warps. Coated boards and their surfaces must therefore always be especially well-maintained and monitored.

Boards made from high-performance plastic and glass fibres

In 1990, Wasa entered a completely new area in the board market with the solid plastic production boards. The Wasa Uniplast® Ultra solid plastic boards, which are manufactured from a special plastic formula, are reinforced with glass fibres that are added to the mixture. This achieves a bending resistance that makes use of stabilizing C-profiles unnecessary in most application cases.



Cross-section of Wasa Woodplast production board



The Kamal concrete plant in Poland relies on Wasa Woodplast production boards

The massive plastic body is significantly less susceptible to serious damage, unlike the boards that are only coated with plastic. Furthermore, the solid material allows the boards to be reground after years of use. This is not possible with boards that are only coated or only possible at disproportionately high costs. Because a thicker plastic coating must be selected at the outset, which clearly drives the purchase price of the board higher, or a new plastic coating must be applied after grinding, which is also associated with high costs and substantial logistical expense.

On the other hand, re-grinding of the Wasa Uniplast Ultra solid plastic board is an economically very interesting solution, since the costs of this service are only 10 % to 15 % of the cost of brand-new boards. The grinding produces an as-good-as-new, flawless surface that can be used again for many years of production. The service carried out by Wasa in cooperation with the Dutch service provider DeeBeeCee is offered statically at the Wasa plant in Thuringia or at

the customer's site. The latter case uses either a grinding system mounted on a truck or a container solution for overseas customers.

Due to its massive construction, the plastic board also allows something that is unavailable in most other board types: fabrication in different, smaller sizes. By simply cutting the short and/or long sides and subsequent installation of new chamfers a smaller board of 1,200 x 670 mm, for example, can be created from a 1,400 x 1,100 mm board within a few minutes. This makes it possible for concrete block producers with several machines to convert boards from a large board system to a small board machine - all without major investment.

However, the greatest difference from all solid wood board types or coated wooden boards is the fact that demonstrably, the plastic-glass fibre mix does not change over the entire working life of the board: whereas wooden and even composite wood and plastic boards become softer over time. This causes the vibration transmission to decline,

but this phenomenon is not found in solid plastic boards. In this case, the production parameters after 10 and more years are still practically the same as on the day of delivery.

In contrast to wooden boards, the plastic boards do not require spraying with water. The plastic boards can therefore be simply stored in the curing chamber during the winter break. Unlike wooden boards, they do not need to be stacked and protected from drying out

The Wasa Uniplast Ultra makes up almost 90 percent of total production board sales at Wasa, which clearly reflects their great success. The remaining 10 % is distributed between softwood and coated boards. In addition to the above-mentioned possibility of regrinding, the main reason for the great popularity of the solid plastic board is their very good parameters in the production process among block manufacturers. The massive plastic body guarantees optimal vibration transmission.



Wasa Uniplast Ultra solid material board



Wasa Uniplast Ultra in use at ABW Concrete in Slovakia



Wasa Uniplast Ultra - half of one side ground

Admittedly, comparable values can also be achieved with steel sheets. However, in the first place, these are almost twice as heavy as a solid plastic board and secondly, many users of steel sheets also complain about the associated susceptibility to rust. Furthermore, production on steel sheets is very noisy, which may result in problems with regional emission and occupational health and safety regulations. After some time, steel can also warp, which requires expensive straightening of the sheet steel. That, by the way, is why Wasa does not offer steel boards in its product range.

The Wasa Uniplast Ultra is becoming an increasingly popular alternative, even in markets that previously had a high affinity for steel, such as the United Arab Emirates or the USA.

This defines the target group for the solid plastic board: the Wasa Uniplast Ultra is primarily of interest to customers who do not shy away from the somewhat higher initial costs and place value on a high-performance board that can be used over the long run. Manufacturers who have used the solid plastic boards for the last 15 to 20 years know that the return on investment often occurs after only a few years. First and foremost, a low rejection rate in concrete block production, consistent board parameters and the option of re-grinding convince Wasa's customers.



Section through the Wasa Tecboard with the internal profiles

Technically, this type of board is recommended, above all, for manufacturers of high quality concrete goods, due to the joint-free surfaces and the excellent vibration transmission. But solid plastic boards are also recommended in areas where wooden boards must struggle with the formation of joints due to climatic conditions.

Plastic boards with honeycomb structure and steel reinforcement

The Wasa Tecboard®, which Wasa officially presented at the bauma trade show in April 2016, is completely new in Wasa's product range. The board consists of two half shells that are produced on state-of-the-art machines using the injection moulding process and welded permanently to each other with a heating mirror.

The interior of the board is distinguished by a special honeycomb structure that is also used in aerospace engineering. The honeycombed structure of the material produces high mechanical stiffness combined with comparatively low weight. To take account of the high external loads in the concrete block plants, the Wasa Tecboard is internally reinforced with additional rectangular steel, which provides the board with extremely high bending stiffness. For example, in 1,400 x 1,100 x 60 mm honeycomb boards that are used in the production of concrete blocks weighing 800 kg, the maximum deflection is less than 2 mm. The board with the above-mentioned dimen-

sions only weighs 59 kg, making it a lightweight among production boards.

The rectangular steels in the interior are permanently attached to the honeycombs and are decisively responsible for the very high rigidity and low bending. This patented matrix achieves E-modulus values of approx. 12,000 N/mm².

This also describes the primary application for this latest type of production board on the market: the places where extremely high weights bear on the boards and the user can only accept minimal bending are where the Wasa Tecboard displays its advantages. The Wasa Tecboard therefore usefully complements Wasa's Uniplast Ultra solid plastic boards in areas where a solid material board would be too thick and too heavy, if it were capable of meeting the requirements for high external loads and limited bending.

Conclusions

If one wished to draw an analogy with a car manufacturer's model range, then a softwood board corresponds to a small car, the PU-coated board is the equivalent of the middle class and the solid plastic or honeycomb board would be the upper class models. One can drive every vehicle class without problems. It is simply a matter of personal demands for one's own ride and the means and quality with which the destination should be reached.

Thus, every board type has a reason for being. In consultations with customers, Wasa's staff very precisely probes the customer's requirements and the plant's features, its cycle, the concrete goods to be produced and regional characteristics. Wasa does not promote high performance boards where a less expensive softwood board could provide good service. But Wasa speaks just as openly if the use of a wooden board or coated board does not seem appropriate. For example, this can be the case where block machines and cycles are in operation that do not handle the boards very carefully and there is a risk of damage to the PU coating in the medium or long term.

For Wasa it is a law of honesty and integrity to offer the customer the board that best suits his needs. This is precisely what has allowed Wasa's wide selection of different board types for over 50 years. ■

FURTHER INFORMATION



WASA AG
Europaplatz 4
64293 Darmstadt, Germany
T +49 6151 7808500
F +49 6151 7808549
info@wasa-technologies.com
www.wasa-technologies.com