

Modern digital production for modern flooring

Deceptively authentic design in decoration and structure, low-maintenance and water-resistant - this is what today's floors provide in order to meet the high demands of the customer. Often the derived timber products industry has even managed to keep one step ahead of the wishes of the market with efficient production systems. Mechanical and system engineering company Hymmen stands at the side of floor manufacturers with a large range of state-of-the-art technology with a focus on industrial digital printing.

Dr René Pankoke, Managing Partner and CEO of Hymmen.



Hymmen does not just provide the latest production technology for conventional manufacturing methods for laminated flooring. The innovative mechanical and system engineer from Bielefeld also provides a full industrial solution for multilayer modular flooring (MMF). This system technology can be adapted individually to the requirements of the flooring manufacturer's methods; from full board with a working width of 2,100 mm right down to highly flexible "individual board production". A complete solution from Hymmen can cover everything from primer application using liquid coating systems to high-quality digital decorative printing, even for difficult decorative patterns, to multiple layers and even structured digital printing using Digital Lacquer Embossing (DLE). The excimer at the end of the system can achieve even further product qualities (e.g. anti-fingerprint, different levels of gloss).

Hymmen's decorative digital printing has already been tried and tested in practical application for MMF. Firstly, the reliable adhesion of the inks on the substrates has been proven.



Wood effect, geometric decorative patterns and more - digital surface structuring with Digital Lacquer Embossing makes it possible.

And secondly, the company has managed to print even particularly difficult flooring decorations (e.g. stone patterns with almost single-colour surfaces) in excellent quality, in a single pass. For this purpose, Hymmen has developed the ACC (Automatic Color Calibration) software. The printed decorative pattern is captured and analysed using scanning technology developed in-house, and the smallest discrepancies and irregularities are corrected.

When the digital method is selected for decorative printing on LVT or multilayer modular flooring, in addition to high quality, clear cost benefits can also be achieved: the traditional process of LVT production includes the extrusion of carrier boards, laminating with a printed decorative layer and a transparent layer for abrasion protection. Purchasing decorative films and the abrasion-resistant layers in the form of thermoplastic films leads to high material consumption and thus increased production costs. Digitally printed LVT on the other hand requires only a base coat, the digital decorative print and an abrasion-resistant top coat for the same finish quality. It is possible to achieve cost savings of approximately 20-30 % by using lacquers and digital printing in place of thermoplastic films.

Hymmen's newly developed JPT-CS digital printing system for conveying and printing single planks with a maximum width of 410 mm is of particular interest for flooring manufacturers with lower output quantities. The specially developed vacuum conveyor secures the planks. It allows for different digitally printed decorative patterns on a flexible individual plank basis. One particular benefit of the individual plank handling system is the fact that the decorative pattern can be printed into and beyond the V-groove. The investment for the JPT-CS is much lower with the same economy per individual board when compared to a system for greater capacities. This is still the case even when the capacity limit of a system (2 million m²/a) is exceeded and investment needs to be made in a second system.

If each plank is to be given both a different decorative pattern and a different structure,

Hymmen Digital Lacquer Embossing (DLE) is the ideal technology. It can be used to print matt and gloss structures in various depth structures into the lacquer. The DLE is an excellent piece of technology even for single-colour finishes, for giving the finishes structures which go beyond the wood effect. All the digital benefits are utilised and further benefits exploited:

- High flexibility
- No costs for rollers or press plates
- Avoidance of make-ready times for roller or press plate changes
- New design options
- Option of integration into existing conventional production lines
- Synchronous structures without repetition
- All tried-and-tested properties of known lacquers are maintained (e.g. scratch resistance, surface hardness, chemical resistance)
- Only one single-pass print bar (up to 2,100 mm)

Hymmen can also supply excimer technology, as the final element of this type of complete production line for multilayer modular flooring, to achieve various levels of matt and gloss finishes. Exposure of surface coatings to short-wave excimer beams leads to polymerisation (hardening) in the upper layer of the lacquer. A thin hardened film forms on the surface. The polymerisation also causes shrinkage. As a result, the surface film features micro-folds, creating a matt finish. No matting agents are required, but they can still be used. The achievable level of gloss finish is 2-30 gloss units (measuring angle: 60°), depending on the parameters and coating. In addition to the various gloss levels without matting agents, the excimer technology provides further benefits:

- Extremely scratch-resistant and abrasion-resistant lacquer finishes
- Increased surface hardness
- Excellent chemical resistance
- Soft-touch effect
- Anti-fingerprint effect
- Perfect reproducibility
- Pleasant feel
- No solvents

A combination of DLE and excimer matting facilitates optical distinction using gloss effects, the increase in surface resistance, the anti-fingerprint effect and an increased variety of designs.

Hymmen's experience in digital printing of more than 10 years, with the first systems purchased in 2008, has led to today's fully industrial systems. The Hymmen technicians used intensive development work to turn the first prototypes from 2008 and 2009 into today's digital production systems, which fully utilise the benefits of high flexibility. Alongside the excellent print image, this primarily includes user-friendliness and the repeatability of the printed deco-

orative patterns, and the automatic digital error correction described above. As shareholder and Managing Director Dr René Pankoke explains, Hymmen has also placed the focus on these factors for the development of new digital printing systems and flooring production lines. There has thus been a high level of investment and effort generated in this area over the last few years in particular. Pankoke: "A great new flooring pattern shown at a trade fair that has been digitally printed behind closed doors is still nowhere near being a system suitable for industry. But our newly developed ACC error correction system now gives us a clear competitive advantage. It guarantees reproducible quality in industrial conditions".

In summary, Hymmen supplies a piece of technology for the manufacture of multilayer modular flooring which is considerably more flexible and cost-effective than conventional methods. In the process, Hymmen is happy to act as a turnkey supplier, providing the complete system, including handling equipment and process control. However, parts of the described overall process can just as easily be integrated into existing production processes. Hymmen employees can call on a decade of process know-how, meaning that individual technical solutions can be created.

www.hymmen.com

Carbonised Wood Surfaces

Combined with Structuring and Glaze

MOCOPINUS continues last year's successful market launch of carbonised facade surfaces with further developments. The innovation leader in the field of planed timber for extravagant surfaces has rediscovered and refined the traditional and centuries-old Japanese method of refining wood with the aid of fire. Inspired by the carbonised look that is produced by the controlled burning, its product designers have created new structures with a touch of uniqueness. During elaborate production technology test series, innovations have been developed and CarboSet¹⁰ is one part of them. The innovation could be seen at the trade fair BAU 2019 for the first time.

With CarboSet¹⁰, the black layer of ash is brushed off after carbonisation. While the carbonised material remains on the hard growth rings, the softer parts show a wavy and considerably lighter indentation as a result. Then the surface is finished with a walnut coloured wood glaze. The result is a particularly concise tone-on-tone colouring.

Distinctive structures in modern design

When burning the upper layer, the individual veins and fibre structures of the different types of wood become unmistakably obvious. The special finishing technology of CarboSet¹⁰ reinforces this effect. In addition, the appearance of the new profile series gets a noble touch with a glaze in harmonised brown shades. If used in parts, the natural wooden profiles are an ideal combination for modern facades of cubic buildings. In using them, the linear "language of forms" can be emphasised.

Durable wood protection in transparent look

The wood cells of the facade profiles are compressed with the carbonisation and are hence better protected against weathering, rot and water. By applying the open-pore wood glaze, the durability

of the noble look is additionally enhanced. There is no need to treat the wood with chemical wood protection agents.

Two kinds of wood in all profile versions

CarboSet¹⁰ is offered in two versions of wood that have ideal material features for finishing and their use in outdoor areas. Be it Nordic spruce or European Douglas fir, each version is characterised by special patterning that gives a distinctive design to the facades. For the planning of individual facade concepts, all profile versions are available from the MOCOPINUS

range of products. In addition, custom-made products are possible.

Another new finishing version - slightly flamed

Facade profiles in slightly flamed look supplement the presentation of innovations at the BAU 2019. By using this form of treatment, the wooden surfaces retain their distinctive structures. These structures are even intensified in the versions Flamed - planed, Flamed - fine-sawn and Flamed - structured. In addition, the selection of the type of wood offers a variety of design.

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