

ACHIEVING THE NATURAL LOOK

Offering authentic-looking surfaces with appealing textures, Digital Lacquer Embossing extends the range of options available to wood-based material manufacturers looking to refine surfaces on an industrial scale. Dr. René Pankoke examines the process



Dr. René Pankoke, Managing Partner and CEO of Hymmen

Digital structuring as a logical addition to digital decor printing has been a topic of discussion since the Interzum and Ligna trade shows in 2017. From the beginning, the development of appropriate processes was a crucial success factor for establishing the technology in the wood-based materials industry. It had to fulfil highest quality standards for industrial production capacities to be accepted by furniture and flooring manufacturers.

This article provides a short introduction into digital structuring in the context of previous technical developments, the specification of the Digital Lacquer Embossing (DLE), further developments of that technology and the benefits it offers to manufacturers in the woodworking industry.

DIGITAL STRUCTURING IN CONTEXT

In order to be able to correctly classify the development of digital structuring, let's briefly examine it in the context of previous technical achievements. When refining surfaces on an industrial scale, wood-based material manufacturers are increasingly making use of the advantages offered by digital printing:

- Industrial production of small output quantities per decor
- Integration of digital printing into the process chains of the decor industry
- Customised mass production
- Quick response to market trends
- Shorter time to market
- Shorter set-up times
- Lower storage costs
- New design options (register lengths, colours, visual depth)

In addition to the look, an appealing and authentic surface feel has also become an indispensable quality feature for furniture, floors and the like. Press plates or structural cylinders are still widely used to create a surface structure. But little by little, the market is realising that the benefits of

to the synchronisation with any underlying decor, and with regard to different gloss grades and the depth of the texture.

For this reason, approaches with positive material application with digital technology were discarded right from the start of the development process because they did

"An appealing and authentic surface feel has become an indispensable feature for furniture and floors"

digital printing are not taken advantage of. Or worse, they are counteracted if a digital process was used for decor printing earlier on in the production process.

MEETING STANDARDS

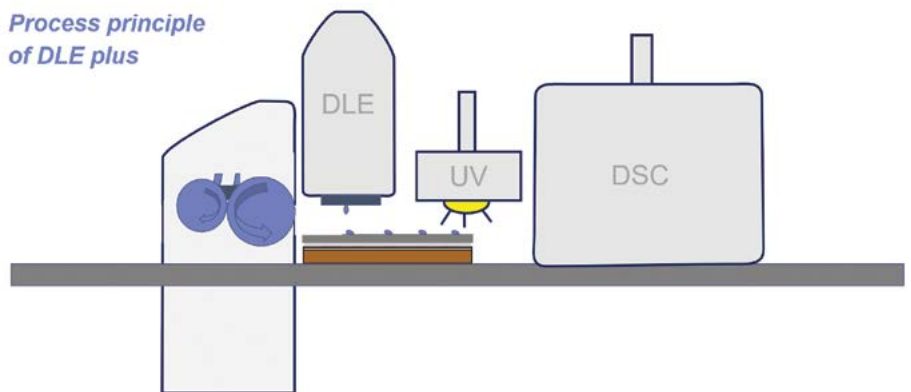
Customers have strict requirements when it comes to textured surfaces. If these are not met, a new technology has no chance of replacing tried-and-tested processes. This includes the scratch resistance of the lacquer surface as well as its appearance with regard

not meet the requirements for abrasion resistance. Even approaches in which the surface texture was to be achieved by direct application of the varnish or where the primer specified the structure were not effective.

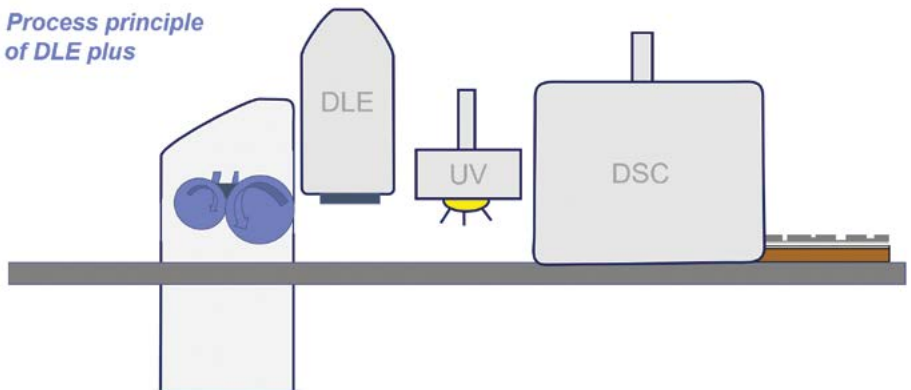
With this in mind, German machine – and plant building company Hymmen drew on its extensive experience in digital decor printing, liquid coating and implementing customer-specific surface quality requirements to develop the industry-standard and patented Digital Lacquer Embossing (DLE) process.

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Process principle of DLE plus



Process principle of DLE plus



The innovative DLE plus process involves a transparent medium being printed with a layer of uncured, conventional lacquer

- Printing speed up to 50 m/min
- Effective working width 70 - 2.200 mm
- Colour system 4 Standard colors CMYK, extendable up to 10 colors
- Additional colours Double CMYK, Special colours



- Optical resolution 1000 dpi at 50 m/min. (CCMMYYKK)
- Printhead Xaar 1003 or Xaar 2001

With a width of 70–2,200mm and only one digital pressure bar, DLE plus technology can be easily integrated into existing processes

DLE TECHNOLOGY

The innovative process involves a transparent medium being printed with a layer of uncured, conventional lacquer. This is done with the help of the proven technology from the Hymmen JUPITER Digital Printing Lines. Physical and chemical reactions create a deep and unique texture.

Digital lacquer embossing exploits all the commercial and technical advantages of the established digital single-pass printing process. These include properties such as high flexibility, short set-up times, no storage costs, new design options and customisation, and doing away with the need to change cylinders or press plates.

With a width ranging from 70mm to 2,200mm and requiring only one digital pressure bar, the technology can be easily integrated into existing processes. Using just a small amount of the structuring medium does not change any of the tried-and-



DLE plus can be used on wood-based panels as well as multi-layer substrates, plastics and glass



Authentic-looking surface made possible with industrial digital printing from Hymmen



Hymmen's advanced Digital Lacquer Embossing process for floors and furniture offers surface textures with deeper lines and sharp edges



Customers expect the lacquer surface to be scratch resistant



Different gloss grades can be achieved with DLE plus

tested properties of the varnish, such as hardness, adhesion, scratch resistance and chemical resistance. Ultimately, textures can be created to run synchronously with the surface decor – regardless of whether this decor was achieved through analogue or digital printing.

CONTINUOUS IMPROVEMENT

At Interzum 2019, DLE received great recognition and won the Innovations Award for high product quality. Still, the Hymmen development team went on to rethink the process from the perspective of customer requirements. While the previous procedure was ideal for certain digital textures, there was still room for improvement when it came to other textures. For special decors, the distinctive depth effect and sharp edges are particularly important in order to get as close to the original as possible.

“An appealing and authentic surface feel has become an indispensable feature for furniture and floors”

The breakthrough came in 2020: 'DLE plus', the advanced Digital Lacquer Embossing process for floors and furniture offers surface textures with deeper lines and sharp edges. The technology can be used on wood-based panels as well as on other materials such as multi-layer substrates, plastics and glass. "Better than nature" said a customer who thought that the digitally printed surface had even better properties than real wood.

ADVANTAGES OF DLE PLUS

The advantages of the DLE plus digital lacquer embossing process can be summarised as follows:

- A large texture depth of 10–200 microns
- Special effects due to high variability in depth
- Sharp edges
- Different gloss grades
- On request synchronised with the printed decor
- Paint surface quality is retained
- Technology can be added to existing conventional paint lines

“DLE exploits all the commercial and technical advantages of the established digital single-pass printing process”

Seeing and touching authentic-looking surfaces is made possible by the continuous application of industrial digital printing from Hymmen – including its commercial and technical advantages. Digital Lacquer Embossing thus offers a completely new benefit for surface finishing – and, with DLE plus, for an even wider variety of textures. ■

Dr. René Pankoke, Managing Partner and CEO of Hymmen



Use this QR code to view Hymmen's DLE plus video

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