

Lamination de luxe

Fixing cheap foils on or around wood-based material boards – that is a thing of the past of laminating technology. Today, high-value materials are finished by means of the laminating process for various fields of application. How? Hymmen Maschinen- und Anlagenbau has decades of experience in laminating technology and can give updates on current developments.

What is laminating?

Laminating is the bonding of several layers of similar or different materials (partly foils) by lacquer, glue or melamine. Laminating is carried out to protect a material and/or to achieve further favourable material properties by applying the material on or under a layer or between two layers. If the bonding takes place by means of wet adhesive, this is known as wet laminating. Accordingly, bonding by means of dry adhesive is called dry laminating. Thermo-laminating is when the bonding takes place under the influence of pressure or heat (see Wikipedia).

Fields of application and technical basic data

The laminating technology is used in various sectors of the decor industry. This includes manufacturers of furniture and flooring as well as producers of full formats and decor boards, manufacturers of door skins and building materials such as gypsum boards, mineral fibre boards and plywood boards. Moreover, there are a lot of special applications for versatile coating materials. Examples of this are thermoplastic foils, high-gloss foils, aluminium sheets and metallic foils, textured foils, laminates, synthetic boards and other sheet materials (see Fig. 1).

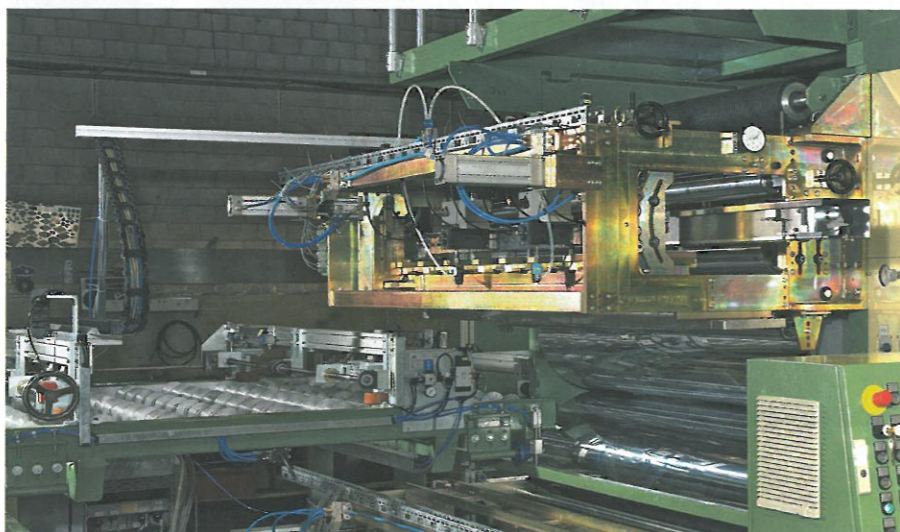


Fig. 2: Glue application, here via slot nozzle.

For laminating, substrates of 1400, 1700, 2000, 2300 and 2600 mm width are processed. Depending on the process, the lines run with a speed of 20-35 m per min. or even with a speed of up to 60 m per min. The adhesives used are casein glue/PVAC, urea formaldehyde resins (UF) and various types of hot melt. The adhesive is applied on the surface by means of a slot nozzle (see Fig. 2) and/or by roller application. The roller application unit is mainly used for board material. Papers or foils are moistened with adhesive using the slot nozzle technique. Paper grammages

of min. 23 g/m² can be used. In the furniture industry, pre-impregnated modern finish foils are dominating today thanks to improved surface properties and structures, as well as thermoplastic decor foils which can also generate very good high-gloss surfaces.

The advantages of the Hymmen laminating technology

Hymmen laminating lines are used in all technical variants. Altogether, the company has sold more than 200 lines worldwide. Customers appreciate the very high surface quality, the pattern-matching laminating due to special camera and control systems by means of register marks, the quick foil change, the automatic foil splicing upon foil roll change, low foil losses due to precise gap control and the highly dynamic cutting system for board separation (see Fig. 3). The boards can be trimmed afterwards by means of an X-ray sensor for board recognition. Another cost-saving effect is generated by the option to use urea-formaldehyde-based adhesive on Hymmen lines. Finally, due to the experience of processes in the woodworking industry that Hymmen has accumulated over several decades, we have succeeded in integrating the laminating lines smoothly into the production processes of the manufacturers and we have even managed to provide solutions from a single source.



Fig. 1: One of four Laminating Lines sold by Hymmen this year: CTK with rubber calender for laminating special foils.



Fig. 3: Exact gap control and highly dynamic cutting system for board separation.

Fields of application in the qualitative high-end sector

The fields of application for laminating technology are diverse, resulting in equally diverse examples of finished products as well. The connection of extraordinary materials is one of the fields of application of laminating technology which leads to high-quality finished products. Many known companies in the woodworking industry use special foils, e.g. for producing modular floorings. Fig. 4 shows examples of laminated surfaces that were finished with structured foils.

In other companies, laminating technology has become an indispensable component of the whole production process. Highly individual processes have been developed.



Fig. 4: Chip board and MDF-board laminated with structured foil.



Fig. 6: The Hymmen Calender Coating Inert (CCI) Line.

A proven method is the LLT process, developed and patent-registered by Classen (see Surface Magazine 2011 and 2015). Laminating takes place at the beginning of the process when the raw boards are coated with a non-impregnated paper. The liquid impregnation of the board only takes place after the paper has been connected to the raw board. When using single-colour paper, the boards are imprinted decoratively in single pass with the Hymmen JUPITER Digital Printing Line before finishing takes place. So for Classen, laminating technology is an indispensable part of the production of high-quality laminate flooring.

Another example of the use of the laminating principle for a production process in the woodworking industry is the Calender Coating Inert (CCI) process by Hymmen.

A coating lacquer which has been applied before is cured by guiding a foil over a calender under oxygen exclusion. The level of gloss on the cured surface can be individually decided according to the surface properties of the foil, from mirror high-gloss to supermatt. The foil can be rewound after curing, or remains on the finished workpiece as a protective foil.

The examples show the versatile application options of the laminating process for high-quality finished products, e.g. the use of high-quality materials which are connected during the laminating process, as well as the integration of the laminating process as a part of complex manufacturing processes in the flooring and furniture board industry.

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Fig. 5: Classen laminates raw boards before impregnation, decorative coating and finishing.