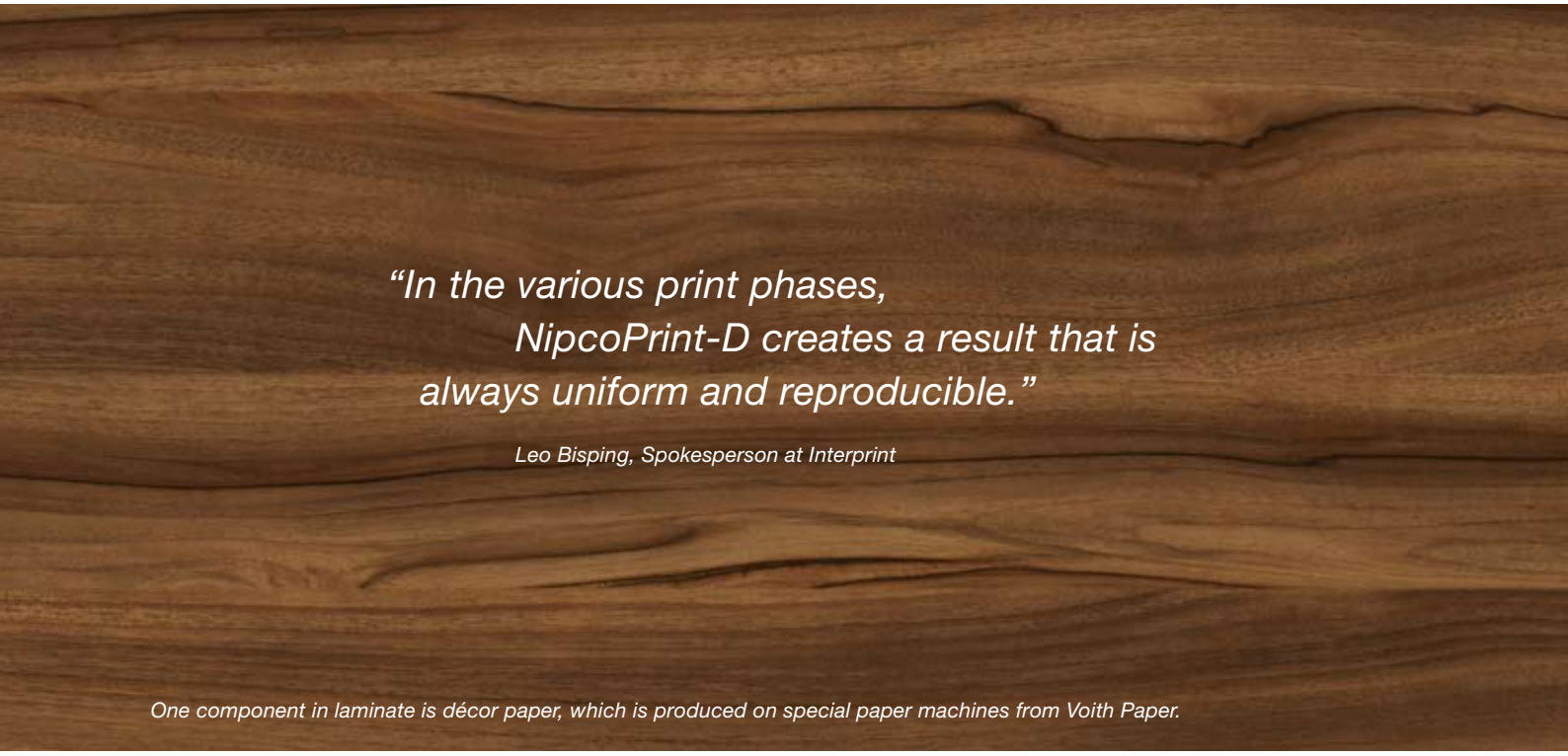
Voith Paper rolls are used for printing décor paper and pressing particle board

Laminate – from start to finish

The use of laminate is showing steady growth rates in the construction and furniture industries worldwide. But how are laminate floors and furniture finishes actually made? Several Voith Paper components are found in the process of making this popular design material. These components include the NipcoPrint-D impression roller system and the NipcoPanel system for grouting MDF and particle board.



"In the various print phases, NipcoPrint-D creates a result that is always uniform and reproducible."

Leo Bisping, Spokesperson at Interprint

One component in laminate is décor paper, which is produced on special paper machines from Voith Paper.

Décor paper forms the basis for the manufacturing of laminate. "The highly opaque printing base paper serves as a carrier for the big variation of decorations that are applied later," explains Reinhard Leigraf of Special Paper Technology at Voith Paper. Laminate is used not only for floors and furniture but also for the interior work in buildings and means of transport such as buses, trains, boats, aircraft and caravans. Décor paper is produced using paper machines made just for this purpose or machines that have been rebuilt for this type of production. Voith Paper is an expert in both cases and has frequently converted existing paper machines for the production of décor paper. For example, Voith Paper delivered an entirely new décor paper machine to the Kehl-based paper producer August Koehler (see page 24 for more information about the partnership between Koehler and Voith Paper). The PM 6 was commissioned in 2000. The machine is 2,300 mm wide and produces décor paper at a speed of up to 820 m/min. The basis weight of the paper produced ranges from 50 to 110 g/m². Up to 40,000 tons of décor paper is produced annually here. One of Koehler's purchasers is the Interprint décor printer with its headquarters in Arnsberg, Germany. Here the décor paper is printed using the gravure printing method. The designs are often replications of wood or stone patterns. Floral and graphical designs are also popular.

A Voith Paper component is also used in the printing process. The NipcoPrint-D impression roller system presses the paper web evenly against the inked gravure cylinder.

Gravure printing all the way to the edge

The gravure print cylinders are usually engraved electromechanically with a diamond graver. The laser graver is a new innovation, which Interprint has been using as the world's first and only décor printer since early 2006. This method uses a laser beam to create the recessed cells for the ink (also known as dots) on the surface of the cylinders.
A pattern generally consists of three different colors and is therefore printed using three different print cylinders. If special effects such as nacre or metallic are desired, the pattern can be made using up to five different colors.

The width of the paper web that is to be printed can vary greatly for décor printing. A specially offset impression roller for the different printing widths is used in order to press the paper on the inked gravure print cylinder. This means that many décor printers have a large stock of various pressing roll range. In turn, this width variation causes time consuming changes of the impression roll each time the web width is changed. “The NipcoPrint-D impression roll system from Voith Paper solves this problem with a precisely adjustable contact width,” explains Peter Marleaux, Sales Manager of Voith Paper Walztechnik AG in Zurich.

Outside the paper web, the NipcoPrint-D sleeve is lifted off of the engraved cylinder in such a way that no ink is transferred to the impression roll. It is possible to print up to the web edge even with thin décor paper. And even for an asymmetrical web position, the NipcoPrint-D ensures the ideal web guide. “This makes expensive and large impression rolls inventory, as well as the frequent changing of pressure rollers, obsolete,” explains Marleaux. “Our current use of 12 NipcoPrint-D impression roller systems has been greatly successful: eight in Arnsberg, three in Poland and one in Russia,” reports Leo Bisping, spokesperson at Interprint. “In the various printing

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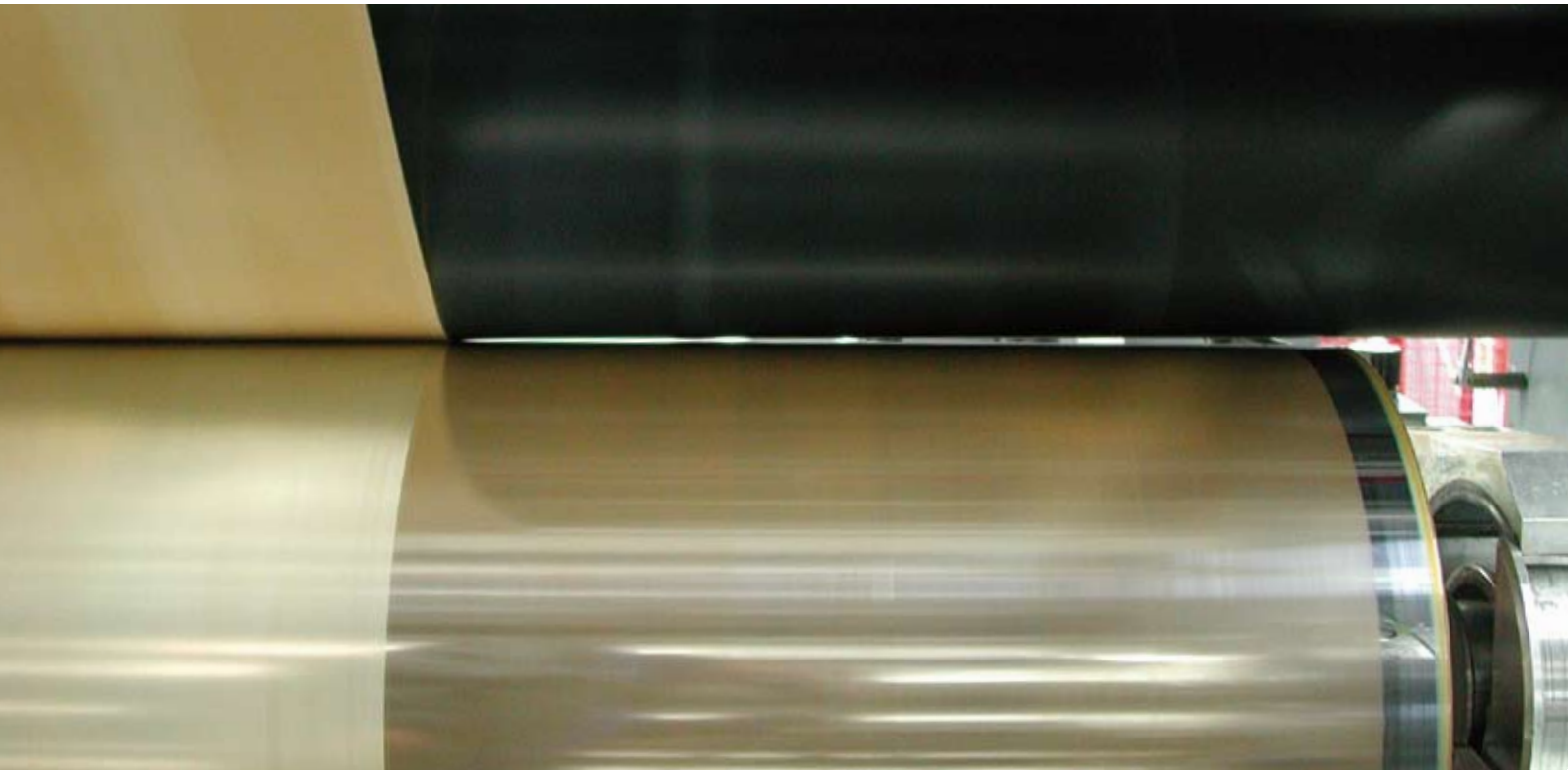

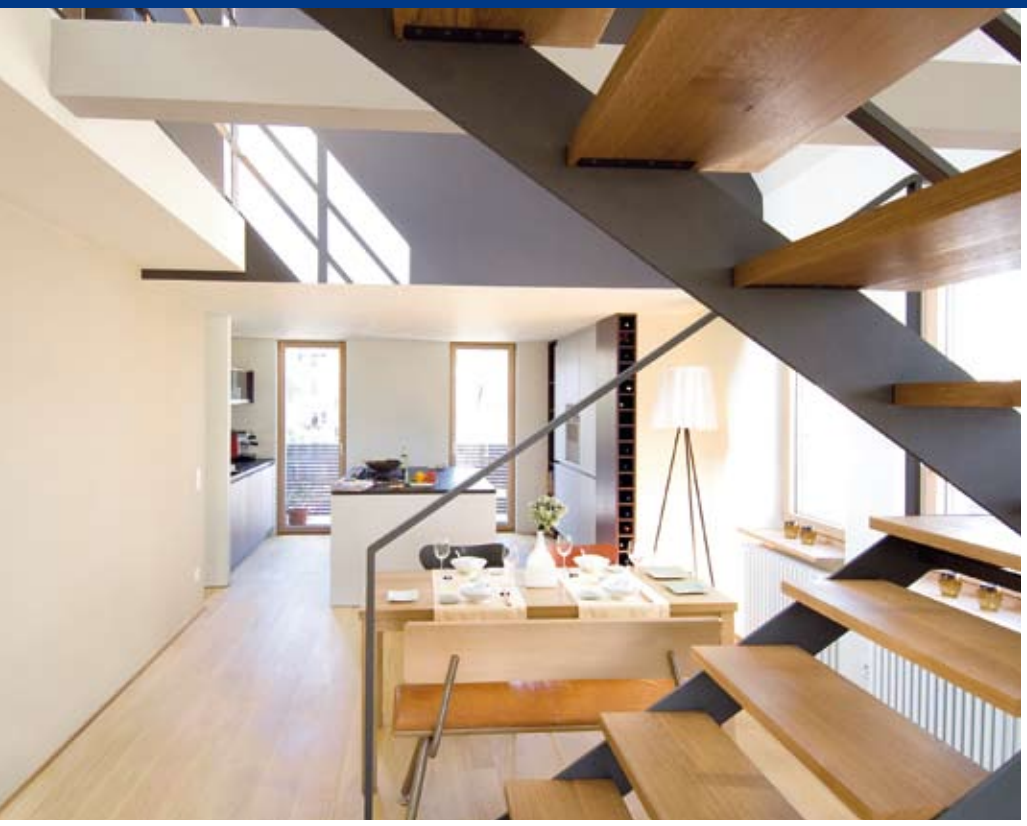

The laminate panels run through several production stages before they are complete. These range from the décor paper production, to the printing and impregnation and all the way to the grouting with MDF and particle board.

Brief cultural history:

Décor paper

The predecessor of today's décor paper has a history dating back over 100 years. In 1907 the Belgian chemist by the name of Baekeland obtained the first patent for a product called Bakelite. The original décor paper was a mixture of wood flour or fiber and phenolic resins that could be pressed into metallic molds and hardened at the same time by heating.

A technique that can be compared with modern-day laminating existed as early as the Ottoman Empire. The Ottomans impregnated paper with vegetable-based or animal fats in order to preserve the paper.

stages, the NipcoPrint-D always achieves an even and reproducible result."

The path to the home-improvement store

After printing, the décor paper is delivered to the wood products manufacturer. A Voith Paper component can also be found here: The NipcoPanel system presses MDF and particle board together. Instead of the standard, very large rolls, Voith Paper Walztechnik AG uses several small NipcoPanel rolls in order to vary the pressure distribution across the width of the board. The material is compressed steadily and especially evenly through the small space between the NipcoPanel rolls. In this way the MDF and particle board achieve an excellent transverse tensile strength and optimum thickness profile.

The printed décor paper first will be impregnated with melamine resin in special impregnating lines usually done by the wood products manufacturer. Next step, it is laminated under high pressure with particle board, MDF board or other substrates.In case of demanded high wear resistance (e.g. floor panels) an additional layer of overlay paper is added to this (see page 20 on the topic of overlay paper). The haptic characteristics of the finish are created during the press operation by the press steel plate (called the caul plate) that can give the final finish a diverse range of structures, regardless of the décor. After this processing stage, the laminated material is made available to the furniture industry or commercially in the form of engineered wood boards. The customer will also find commercially available finished products in the form of laminate flooring because it is a building material that is easy to work with and durable. An additional material used for the finish is the finishing film used for furniture or interior work. This material is usually impregnated already in the paper machine and is known as a preimpregnate.

Contact

Peter Marleaux
peter.marleaux@voith.com