

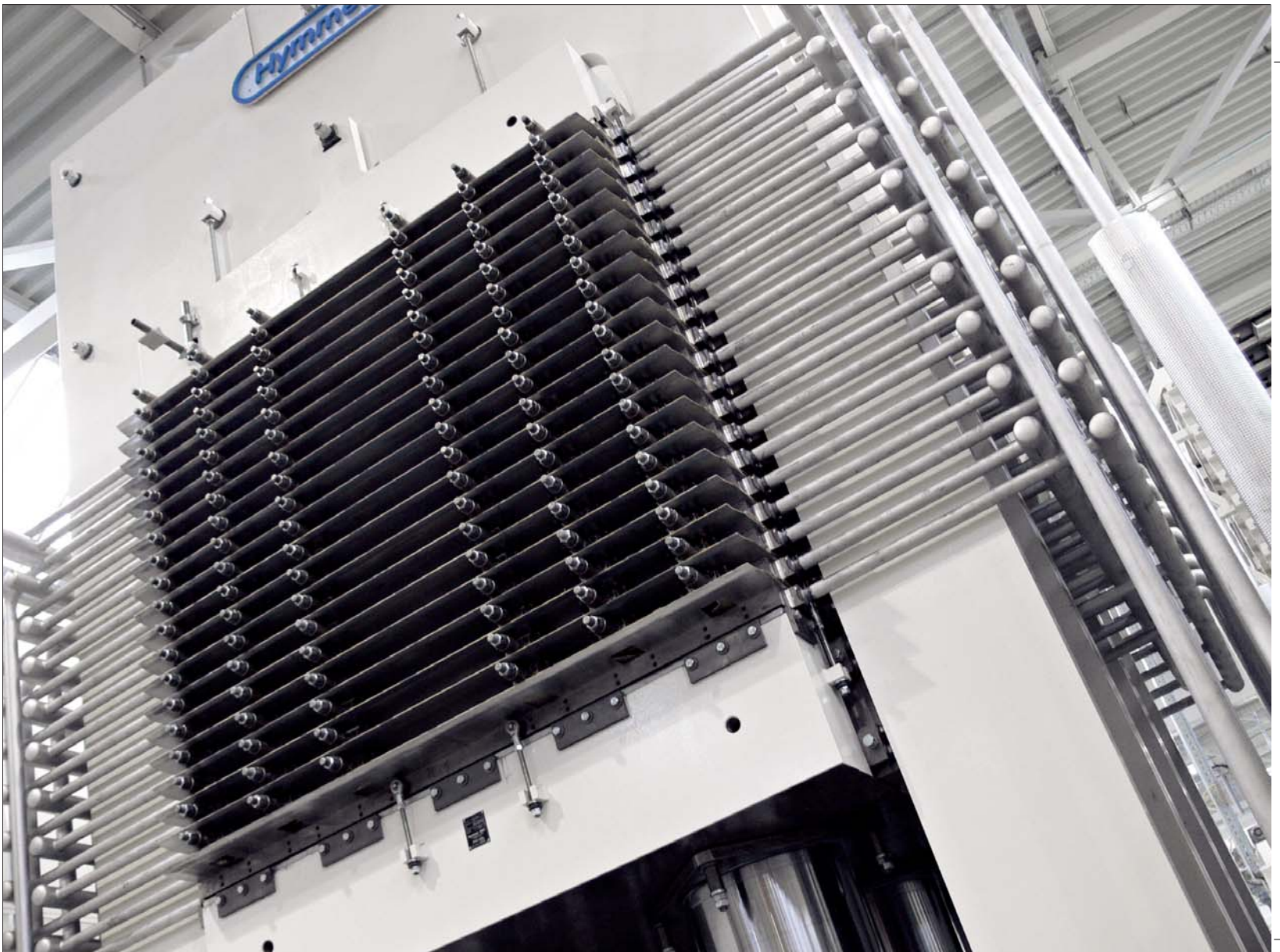
Mirror gloss from 20-daylight press

When the decision was taken at Fundermax to extend capacity in the field of high-gloss direct lamination, the favourite choice for main plant supplier quickly emerged: the contract was awarded to Hymmen and its subsidiary Hymmen EMC. HK has already had a chance to appraise the new plant in operation.

By Wolfgang Rüter

Acquired by Hymmen in 2004, this company was no stranger to Fundermax. The last cooperation between the two involved a general overhaul, modernization and extension of a Pagnoni press, constructed in 1999, from a 24 to a 26 daylight plant.

With plenty of positive past experience to go on, opting for EMC to complete the la-



test project to extend Plant III in St. Donat bei St. Veit was the logical choice. The specialists at Hymmen EMC Pressentechnik GmbH, formerly Becker & van Hüllen, have gained a sound reputation as long-established service providers in the field of hydraulics and press technology. They take charge of maintenance, repairs and also overhauls of any press make – irrespective of manufacturer. But to date, the firm had not yet constructed complete multiple-daylight presses or systems.

That Fundermax went ahead and commissioned EMC/Hymmen with the construction of an entire laminating line including 20-daylight press complete with feed, laying station for melamine resin papers and handling/conveying technology as well as trimming and finish stacking stations was a vote of confidence, and was taken up as special challenge by Hymmen EMC Pressentechnik. It offered the company an opportunity to prove for the first time that it has the capability to construct this type of press. Fundermax opted to take the vital cooling section of the plant, which is essential for production of high-gloss/mirror finish surfaces, under its own direction, and commissioned the company Ness Wärmetechnik to produce the heating and cooling system. Hymmen had itself worked together with Ness on many past projects, and the two companies enjoy an excellent cooperative rapport.

The company Becker Maschinenbau from Langenberg also played an instrumental role in providing special detail solutions for some of the conveying technology, supplying items such as components

Top to bottom:

- **The heating-cooling system ensures extremely accurate temperature control**
- **Panels prepared for pressing with mounted press plates and press pads in the feed basket**
- **Panel transport to quality control using suction cup lifters**
- **Stacking locations for laminated and trimmed panels**

Frontpage: By integrating a recooling press into its new laminating line, Fundermax has provided an innovative and ideal production environment for the manufacture of high-gloss surfaces of exceptional brilliance.

(Photos: W. Rüter)





Hymmen Project Manager Herbert Czeschka (left) talking to the Fundermax Marketing Manager Robert Karlhofer (centre) and Fundermax Project Engineer Michael Obweiger (right)



for the raw panel feed system, transport panel alignment, control swivel fixture and the stacking system.

Investment for the future

In installing the new plant, the wood-based materials and decorative laminate specialist was very keen to ensure the implementation of many of its own ideas and innovations and so ensure a healthy outlook for the future of the site as a producing location. Focusing on the rising trend it recognized some time ago for high-gloss surfaces in all the world's major furniture markets, Fundermax has played an instrumental role in shaping this development with its own internally developed high gloss decor products. Its achievements include development of a surface quality whose level of brilliance exceeds the previously attainable level by around 40 percent. This mirror gloss surface effect, applied using the direct lamination principle, is based on a special newly developed resin formulation and calls for totally new production sequences. These have now been put in place with completion of the factory extension and installation of the new plant. With a useful area of around 3,500 sq.m, the generously dimensioned new hall layout offers plenty of space for the new laminating line, which is used for finish treatment of raw 16 and 19 mm thick chipboard and MDF panels (also produced by Fundermax) with decor paper to create

its Star-Favorit pressed laminates to tie in with other products from the company's product portfolio.

The laminated panels are used both for interior fittings and also in furniture production. Alongside around twenty decor finishes available from stock, Fundermax is capable on principle of supplying any other bespoke, fully individual decor finishes.

Efficient production process

The complex production plant supplied by Hymmen EMC Pressentechnik is provided with raw panels, decor and core paper from an extensive warehouse. It is fitted with three feed conveyors which permit the simultaneous loading of two raw panel stacks each, making the plant extremely efficient. The decor and core papers – packs of up to 0.5 to 1.5 mm can be processed depending on the lamination thickness – are manually laid, and the substrate panels for lamination are fed in automatically and then placed in intermediate storage in the feed basket until they are transferred into the 20-day-light press.

Following pressing, the laminated panels are recooled while the press remains closed, and then removed from the plate circulation system. The upper press plates and pads are permanently mounted in the press, while the transport plates and their respective lower press pads and plates are continuously circulated and auto-

matically aligned in the angular transfer. A pressing cycle takes around 20 minutes.

Five-shift operation of the plant, with each shift manned by a team of four operators, is planned for the end phase. The plant will be used exclusively to process melamine resin decor papers using the new formula. The papers will be supplied by the Impress impregnation plant located directly adjacent to the new hall, which is also part of the Group. To do justice to the wide-ranging surface variants by providing structures which are interesting to the touch as well as the eye, the laminating plant is equipped with a magazine encompassing a total of 176 different plates. Here too, automatic loading and unloading to and from the magazine maintains optimum production flexibility.

Quality control and surface protection

After discharge from the press, the panels are trimmed longitudinally and transversely on an enclosed angular double-end tenoner from Becker and then cleaned by a brushing machine. The downstream quality control process entails the panels being lifted, swivelled, appraised by trained personnel, and categorized according to a maximum of four quality groupings. They are then protective film wrapped in a protective film station developed by Hymmen, and transported to the four sta-

cking stations. To protect the panels, a dummy board is fed in to form the uppermost and lowermost layer of each stack, before the panels are transported into the warehouse by fork lift truck.

Logistics and an internally developed warehouse management system

To ensure a perfectly functioning logistical system – the Fundermax export quota has remained fairly constant at over 70 percent for a good ten years – Fundermax has developed its own warehouse management system. This uses the factory's inner courtyard as a logistics centre. Here, the panels are loaded into trucks or carriages for railway transportation and dispatched to customers around the world. With its own rail link for loading, the company is also ideally equipped to deal with any size of order or consignment.

Heating-cooling system with extreme temperature control precision

The pressing plant, which is designed to act as a recooling press, is linked to a heating-cooling system supplied by Ness. The energy carrier used is water, which is heated to 170°C and then cooled to 35°C for the cooling process. The storage capacity for hot and cold water is 18,000

and 25,000 litres respectively, and the four shuttle storage units each have a capacity of 5,500 litres. The press is supplied by a 132 kW pump with an hourly output of 650 cbm.

One of the most important requirements for achieving the stipulated standard of mirror gloss quality was to ensure highly accurate temperature control and temperature gradients during the process. This called for precise coordination between the installed equipment, conveying and control devices, pipe cross-sections and so on, so that the rates of temperature change and the necessary temperature curves could be achieved without problems.

Highly efficient use of energy was another stipulation. Different energy storage

reservoirs and cooling systems can be used here to utilize the inherent potential for recovering a high proportion of production cycle heat for repeat use in the next cycle.

For reasons of economy, the hot water supply to the press was connected to the existing hot water boiler house. In order to cope with the heavily fluctuating output requirement, a hot water storage system with charge control was installed. This ensures that the press is supplied with hot water while at the same time protecting the factory network from temperature fluctuations. The plant is designed for fully automatic operation. Control and regulating functions are performed by a modern programmable logic controller with touchpanel.

Time frame and plant technology in detail

From the date on which the plant was ordered in August 2008 it took just fifteen months to final acceptance in October of 2009. The start of construction was December 2008, with plant installation beginning in March of 2009. Commissioning work got under way in May, with the first panel rolling off the line as early as July 1st. This was followed by three months of trial operation and finally the official opening on October 23rd.

The 20-daylight recooling pressing plant provides a pressing force of 4,000 tonnes and achieves a specific pressure of max. 761 N/sq.cm. The pressure is generated by six hydraulic cylinders (max. 315 bar) with a total capacity of 8,000 litres of hydraulic oil. The heating platen format is 3,000 x 2,200 mm, the daylight clearance is 90 mm. One pressing cycle takes approximately 20 minutes. For lamination of chipboard and MDF panels between 6 and 32 mm in thickness with finished formats of 2,820 x 2,070 mm or 2,820 x 1,870 mm.



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