

Keeping it simple. Making it profitable.

To enable this cartonboard producer to increase production of containerboard, ANDRITZ retrofitted a Twin Wire Press and supplied new drying cylinders. The retrofits were not complex, but exceptionally effective.

▲ ANDRITZ replaced more than 30 cast iron dryer cylinders with new steel ones to increase the throughput of PM4.

The Varel mill is located in the north-western corner of Lower Saxony in Germany. It is one of the largest paper and board producing facilities in Europe – using recycled fiber to produce 850,000 t/a of paper and board on its four production lines.

Even with this high level of output, mill management was eager to increase production of testliner and white-top liner. ANDRITZ assisted in the expansion.

Market-driven

Based on marketing studies showing increased demand for the higher grades

of testliner, fluting, and white-top, Varel's management decided to invest in a capacity expansion of PM4, a 5.10 m wide machine producing a wide range of grammages (100 to 200 g/m²).

Uwe Wollschläger, one of the four managing directors of the mill, and his colleagues sought advice from ANDRITZ and what could be upgraded to increase throughput of PM4. ANDRITZ had been a supplier of technology and services to Varel for many years, delivering a Twin Wire Press for dewatering recycled fiber in the stock preparation plant in 1987, as well as screens, screen baskets, and refiner plates on a regular basis.

“We make it a point to periodically improve our key machines to obtain the newest technological advantages and increase our output and quality,” Wollschläger says. “This helps us extend the life, and the economic return, on our existing equipment.”

Working within constraints

The project scope around PM4 included expanding the amount of pulp available (by eliminating bottlenecks in the dewatering process) and extending the drying capacity of the machine. Like virtually any retrofit and upgrade project, the work at Varel would be constrained by space and time.

According to Oliver Kern, Varel's Production Manager: "We have been happy with the Twin Wire Press as it has been operating well for many years. While we needed to increase throughput from approximately 220,000 to 300,000 tonnes, we also needed to maintain the outlet dryness of at least 30%."

The other potential complication, according to Kern, was that the drying capacity expansion on PM4 would be constrained by the location of other downstream machinery. "We were not going to move our slitter rewinder operation," he says. "So the space limit for machine extension was no more than 15 meters."

Dewatering upgrade

ANDRITZ had a ready solution for expanding the capacity of the old Twin Wire Press while maintaining the high outlet dryness required. According to Karsten Laatz, ANDRITZ's service sales manager for Germany, "One key to increasing capacity in an older press is to modify the wedge sec-



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Uwe Wollschläger
Managing Director
Papier- und Kartonfabrik Varel

tion," Laatz says. "Older presses have a rigid wedge zone where the inlet and outlet gaps are fixed. We have an innovation for this which is standard on new presses, but can also be retrofitted to existing ones."

That innovation is called a Floating Wedge. Laatz explains: "In our design, the bottom part of the wedge is fixed and the top part is separated from the machine frame so that it can self-adjust to the pulp mat. At the outlet end, the top wedge virtually floats on the mat. This allows smooth, fine adjustments of the inlet gap and the dewatering pressure."

Variations in the flow or consistency of the pulp feed are compensated to increase throughput, consistency, and process stability. This helps increase the effectiveness of the dispersing system.

According to Ewald Kulhanek, Product Manager for wire machines at ANDRITZ, the drive roll system was also upgraded.



◀ (Left to right): Karsten Laatz, ANDRITZ's Service Sales Manager for Germany; Hartmut Langner, Varel's Paper Production Manager; Oliver Kern, Varel's Production Manager; and Georg-Michael Sautter, ANDRITZ's Director of Sales for paper and board machines in front of the newly rebuilt drying section of PM4.

Extended drying capacity

"With PM4 now upgraded, we see about approx. 40% capacity increase," Kern says. "We expect to be able to go even further when we see the right signals in the market."

Replacement of more than 30 of PM4's cast iron dryer cylinders with new steel ones manufactured by ANDRITZ – together with the addition of more cylinders – led to a considerable improvement in throughput and efficiency of the machine.

According to Georg-Michael Sautter, Director of Sales for ANDRITZ's paper and board machine business, the cylinders were custom-designed to fit the Varel machine. "Due to the special design of our manufactured steel cylinders, compared to the old cast iron ones, Varel can now use the width of the cylinder surface to create a uniform drying profile across the sheet, especially at the edges," Sautter says. "These cylinders have a high-performance design to increase drying rates without increasing energy consumption."

Sautter explains that steel is a better heat conductor than cast iron (5-7% improvement). "Fewer steel cylinders are required than cast cylinders to achieve the same drying capacity," he says. This was a real advantage for the PM4 project, since space was limited. Then, too, there is the safety issue. Even the smallest crack in a cast iron unit can be potentially dangerous due to the explosion tendency of cast. The elasticity of steel is a major safety factor."

"The ANDRITZ upgrades to our Twin Wire Press and the upgraded drying cylinders are simple and effective," Kern says. "It is amazing to think sometimes just how much keeping it simple really works."

CONTACT

Karsten Laatz, Service
karsten.laatz@andritz.com

Georg-Michael Sautter, Sales, Paper & Board Machines
georg-michael.sautter@andritz.com

"Usually, the outlet dryness of the press will drop as production of the machine is increased," he says. "The drive load required for increased production rates will be higher, making it impossible to transmit enough torque by the angle of wire wraps only. The wires will start to slip."

So, ANDRITZ's solution was to rebuild the existing drive roll to a drive roll press nip system. Nipped drive rolls create a stronger grip on the wire which, in turn, increases outlet dryness due to the additional high-performance nip.

Actually, the entire drive system was improved. Each drive roll is now driven by its own gearbox, motor, and frequency controller. The master drive is speed-controlled from the production rate setpoint and control of the slave drives is synchronized. In addition, the upgrade included the addition of a new wire regulation system and the re-cladding of all press rolls with stainless steel. Three of the press rolls were grooved to handle the higher filtrate quantities created by higher production.

Seamless installation

"It is a simple solution, but one that has worked perfectly for us," comments Hartmut Langner, Paper Production Manager at Varel. "We got the results that we expected, and in the time required. Good communications and good cooperation with ANDRITZ helped us work seamlessly."

Service and upgrade work on the Twin Wire Press was completed in June 2012. "ANDRITZ did virtually all the work on-site, with the exception of the re-cladding and grooving of the rolls," Langner explains. "The actual time for the rebuild was about one week. The work was completed without delays."

"We are now getting considerably increased production, precisely along the lines we originally demanded," Kern points out. "We are seeing greater efficiency in the disperger following the upgraded press. The filtrate from the press is very constant and stable, so the processes utilizing this filtrate as dilution water have improved. ANDRITZ's innovations are performing just as expected."

ANDRITZ rebuilt Varel's Twin Wire Press which was installed in 1987 to increase capacity from approximately 220,000 to 300,000 tonnes while maintaining the desired outlet dryness. This included an upgrade to a Floating Wedge design, rebuild of the drive roll press nip, a new wire regulation system, and re-cladding of all the press rolls. ▼

