MAKING IT ALL ADD UP

ANDRITZ has recently completed a service at Mayr-Melnhof's FS Karton mill, involving one MG cylinder, two web stabilizers, three dryer cylinders, and a fourth headbox service. From order to completion, it all added up to four service operations in just four months. So – did it all go by the numbers?

Although it started up back in 1990, the 5.25 m wide, 350,000-tonne BM5 at FS Karton in Neuss, Germany, is still one of the largest and most modern recycled boxboard machines in Europe. And every January, the mill makes sure it stays that way – with new improvements.

Udo Koolen, FS Karton's Project Engineer, explains why FS Karton chose ANDRITZ to carry out the latest upgrades. "ANDRITZ knows the machine – they built it. But also, I like that we got everything from one supplier that took responsibility for all the work, including the actual installation – not all suppliers offer that."

FOURTH HEADBOX COMPLETES THE SET

BM5 uses four fourdrinier formers to make its boxboard - first top layer, second top layer, filler layer, and back layer. ANDRITZ recently revised the headboxes for three of the four formers and completed the full set this January, bringing the headbox for the filler ply back up to date. Johannes Kraxner, Service Manager, ANDRITZ Tissue, Paper & Board Machines, notes that the headbox had already far outlasted its design expectations, "For example, you would normally change the diffusor inserts every 8-10 years, but these had lasted 16 years!"

As part of a full headbox service, ANDRITZ installed new bottom and top slice lip and renewed all seals. "We took it completely apart," Kraxner explains, "which has given us benefits such as improved cross-direction and machine-direction basis-weight control and correct sealing on the mixing chamber right from the start-up. The upgrade has restored full technical functionality to the headbox, enabling it to reach the desired process and quality parameters."

DRYING CYLINDERS – "A VERY SKILLED JOB"

Downstream, the dryer section at Neuss comprises 44 pre-drying cylinders before the MG cylinder, followed by 21 after-drying cylinders. ANDRITZ installed three new 1.8 m diameter, 5.7 m long, *Prime*Dry Steel cylinders in the pre-dryer section, replacing three cast-iron cylinders.

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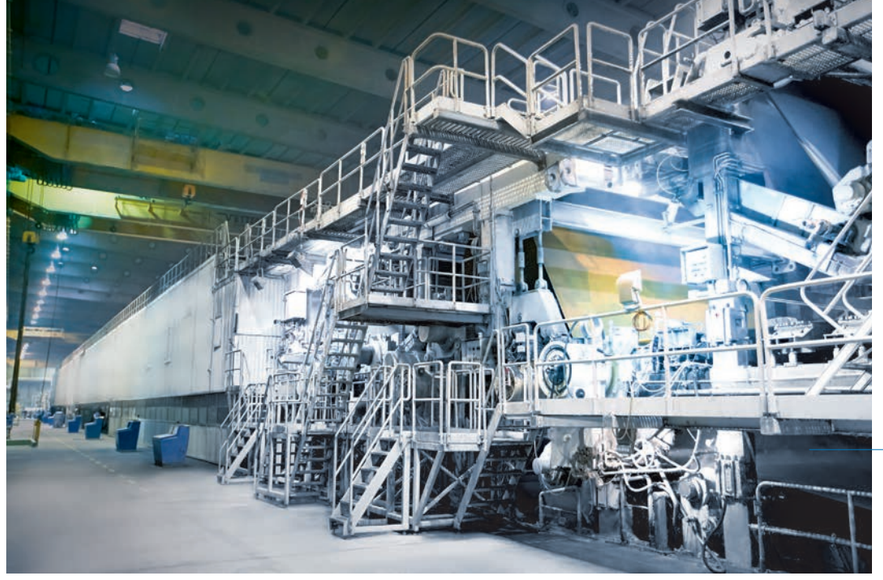
ANDRITZ has now serviced all four headboxes at Neuss during the past five years. The most recent upgrade was for the filler ply, which restored the headbox's full technical functionality, enabling it to reach the desired process and quality parameters.



In January 2017, ANDRITZ carried out a suite of service upgrades on the 350,000-tonne BM5 at Mayr-Melnhof's FS Karton mill in Neuss, Germany, the largest recycled boxboard machine in Europe.

And it wasn't easy. Koolen comments, "I was very impressed with how ANDRITZ installed the drying cylinders. It was a very skilled job; they had to be precise down to the millimeter."

Kraxner adds, "Some installation firms actually said it couldn't be done. You've got to know what you're doing."

"Despite the difficulty, the job had to be done for technical and safety reasons," says Koolen. "Two of the old cylinders had become eccentric and were causing the doctors to jump, risking web breaks. And the third older cylinder had been leaking hot steam, causing wear and abrasion, as well as being dangerous."

The new steel cylinders can operate at much higher parameters (6 bar pressure, 1,200 m/min speed) than the cast-iron cylinders, but they will only be used at the existing parameters for now (six bar of pressure and 850 m/min speed). Koolen points out, however, "We always look at the big picture. All new investments have to be able to meet future goals. For example, the plan is to raise the machine speed, so the new cylinders have to be set up for that."

For now, though, Neuss has already achieved its immediate goals of more homogenous heat transfer, smooth runnability, safety, and a return to design quality.

MG CYLINDER – A BALANCING ACT

Although the MG cylinder is in the middle of the dryer section and runs hot, it is not actually used for drying. Instead, it ensures a smooth printing surface on the white top layer of the cartonboard and liner produced on BM5.

Over time, line pressure had resulted in the MG cylinder becoming marginally eccentric, by 0.6 mm over a diameter of 6,400 mm (i.e., less than 0.01%) – but even that was enough to require re-grinding of the cylinder. "It wasn't a problem that was obviously noticeable," Koolen says, "but it was causing the cylinder's three doctors to move and was affecting the main bearings."

The grinding reduced the overall diameter by 1 mm, ensuring that the MG cylinder was perfectly round and smooth again, increasing machine stability and product quality.

Kraxner explains just how intensive the grinding process was, "Test speed has to be achieved, with full steam and heat. The balance is then measured, it is all shut down, then locked down. Electrics are disconnected and we wait for it to cool down, which takes hours. Then the human-access hole is opened and two men are sent inside, where they install weights for test balancing. Finally, the men back out and close it all up again, unlock the whole thing, reconnect the electrics and restart. We did all of that three times."

This intensive work was carried out on a mobile basis. The actual grinding itself was performed by ANDRITZ's mobile grinding unit, and the operation also used a mobile steam station for the first time, as the machine electrics had to be switched off. In addition, the post-grinding balancing was done using mobile balancing.

Koolen empathized with the workers: "It's hard work for the balancing guys. It's 40-45° C in there and very humid. They are completely exhausted at the end."

WEB MASTERS

The service in January also included two new *Prime*Run M web stabilizers, in addition to two *Prime*Run M units that ANDRITZ had installed six months earlier. These easy-maintenance units help to improve efficiency by reducing web breaks, while their patented vacuum design also reduces energy consumption.

Koolen explains, "We wanted to improve runnability. There had been some fluttering, which was affecting machine speed and performance." With the four new stabilizers in operation, threading is now more stable on open draws, which has improved runnability, even at the highest speeds. As a result of the new drying cylinders, plus the web stabilizers, "the machine has calmed," confirms Koolen.

TOUGH JOB, BUT SOMEONE'S GOT TO DO IT

One of the challenges of this project was performing all the parts of the service package a very limited time and space. For example, the crane was needed for many different parts of the project being done at the same time.

With the shutdown scheduled to last less than a week, Koolen points out that, "Timing was really important. There were contractual fines in place if any of the drying cylinders were installed late. Any delay would have been a catastrophe. But ANDRITZ did it all on time. You've got to have people who can work hand in hand, and it worked really well."

Kraxner adds, "Our speed was another one of the reasons we got the project. It was only four months from the order being placed to start-up. We delivered the hardware on Thursday, 29 December 2016 and installed it the following Tuesday. It was almost a just-in-time delivery."

Of course, while speed was obviously important, quality was key. And Koolen says, "Technologically, everything went smoothly. We did what we planned to do and achieved everything we wanted. The start-up took place with no project-related problems at all. The sealing in the headbox worked. The cylinder set-up was a reward for good preparation and discussions between ANDRITZ and us. It all worked well, which was great for me, because I didn't have to run around too much!"

Kraxner concludes, "We were working for the future here. The customer is happy and they know how much we did. We have to work like we're on the same team."

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