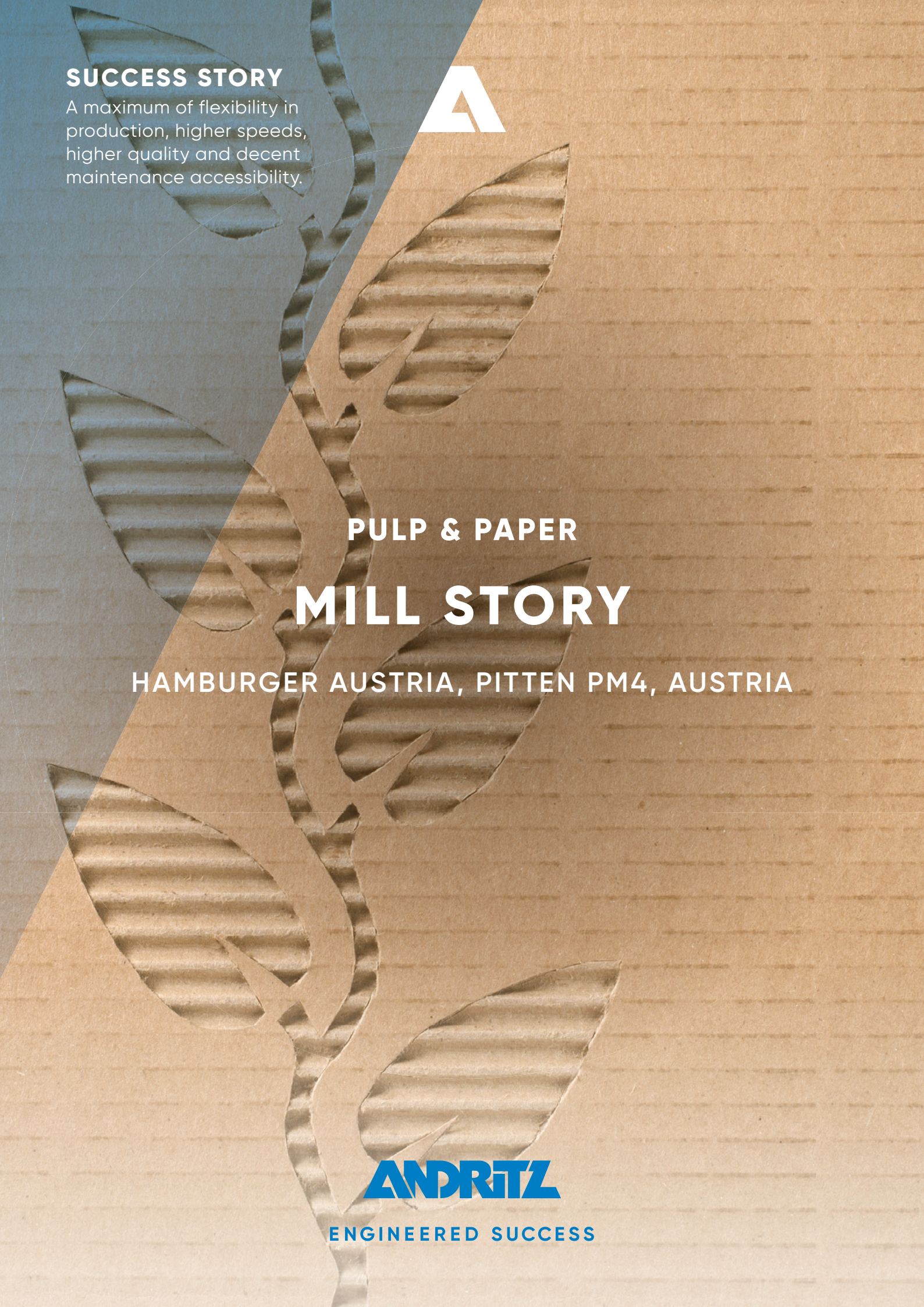
SUCCESS STORY

A maximum of flexibility in production, higher speeds, higher quality and decent maintenance accessibility.



PULP & PAPER

MILL STORY

HAMBURGER AUSTRIA, PITTEN PM4, AUSTRIA

ANDRITZ

ENGINEERED SUCCESS

Gathering impressions – Lower Austria and Pitten

Pitten is located in Lower Austria, in a province rich in culture and wood.

The region around Pitten is well-known for it's delicious wines; @ Regionales Weinkomitee Weinviertel/Petr Blaha

Situated to the east of Upper Austria, Lower Austria derives its name from its downriver location on the River Danube, which flows from west to east. Lower Austria has a 414-kilometer international border, with the Czech Republic (mainly South Moravia) and Slovakia. The province surrounds the city of Vienna.

Lower Austria is divided into four regions, known as "Viertel" (quarters): Weinviertel or Tertiary Lowland, Waldviertel or Bohemian Plateau, Mostviertel and Industrieviertel.

These regions have different geographical structures. Whilst the Mostviertel is dominated by the foothills of the Limestone Alps with mountains up to 2,000 m high, most of the Waldviertel is a granite plateau. The hilly Weinviertel lies to the northeast, descends to the plains of Marchfeld in the east of the province, and is separated by the Danube from the Vienna Basin to the south, which in turn is separated from the Vienna Woods by a line of thermal springs (the Thermenlinie) running north to south.

Pitten is a town in the district of Neunkirchen in the Austrian province of Lower Austria. Originally Pitten gave its name to the whole region and was known as the "Pittener Waldmarkt" up to the 19th century. Nowadays the region covers an area of 13.08 km², 53.75% of which is forest.

View of the Schneeberg

At the entrance to the Pitten valley, the old market town of Pitten, with the River Pitten, lies surrounded by wooded hills. The Schlossberg with parish church (decorated in baroque style in 1731) is the landmark of Pitten. From the top of the churchyard wall, the view extends across the "Hohe Wand", the "Schneeberg", the "Rax", the "Semmering", and the high mountains of the "Wechsel" region. Among the sights are the old rock church with frescos from the 11th century and the baroque parish courtyard with its beautiful arcades, dating back to 1652. On account of its favorable climate, Pitten is known as the Merano of Lower Austria.

PITTEN – KEY FACTS:

- **Inhabitants: approx. 2,500**
- **Size: 13.08 km²**
- **Main industries: paper production, tourism**

Pitten in 1882

Krumperk Castle, close to Domžale.

Hamburger Containerboard – A passion for paper

Hamburger Containerboard is one of Europe's leading producers of high-quality containerboard and gypsum plasterboard qualities, manufactured mainly from recycled paper.

Hamburger Rieger, mill Gelsenkirchen, Germany: 200,000 t/y capacity

Hamburger Rieger, mill Spremberg, Germany: 315,000 t/y capacity

Hamburger Rieger, mill Trostberg, Germany: 170,000 t/y capacity

Hamburger Hungaria, Dunaújváros, Hungary: 700,000 t/y capacity

Hamburger Detnaş, mill Corlu, Turkey: 100,000 t/y capacity

Hamburger Detnaş, mill Denizli, Turkey: 70,000 t/y capacity

2 MILLION TONS PER YEAR

Hamburger Containerboard is among the leading producers of high-quality containerboard and gypsum plasterboard qualities across Europe, with an annual capacity of about 2 million tons of paper. The products are made mainly of recovered paper at the mills in Gelsenkirchen, Spremberg and Trostberg (all Germany), Dunaújváros (Hungary), Corlu and Denizli (both Turkey) and Pitten (Austria).

The products, such as Austroliner, RiegerLiner, SpreeWhite and SpreeGips, are considered paramount and are valued throughout Europe. The expansion into lightweight products completes the whole range of recycled packaging papers.

RAW MATERIALS IN PAPERMAKING

At Hamburger Containerboard, recovered paper is the main raw material used for papermaking. Recycling this material makes a substantial contribution toward avoiding waste.

Austria's first industrial paper mill – Hamburger Austria, Pitten

The Pitten mill has more than 150 years of experience in papermaking and represents tradition, culture, and expertise.

Hamburger Austria, Pitten, Austria: 445,000 t/y capacity

WILHELM HAMBURGER

The paper mill Hamburger Austria, Pitten, bears the name of its founder, Wilhelm Hamburger, who erected a factory for the production of rag pulp in Pitten in 1853.

Wilhelm Hamburger, born in Blumfeld in the former Grand Duchy of Baden in 1821, was considered one of the pioneers of industrial development in the German-speaking world. As well as being an engineer, a businessman, and a papermaker, he was also one of the first tourism managers. While setting up his paper mill, Wilhelm Hamburger also took lasting measures toward improving the infrastructure of the Pitten Valley. By doing so, he set the stage for tourism to gain a foothold in the region. At the turn of the 19th century, Pitten was in its heyday, having become not only an industrial center, but also a destination favored by summer visitors.

THE PAPERMAKING EXPERT

At the age of 12, Wilhelm Hamburger was an apprentice turner of artistic objects and later went on to study physics, mathematics, and mechanics. After working in a number of different professions, he later moved to Pitten in 1848, where he had been hired as an expert in papermaking by the Werdermüller paper mill.

ESTABLISHED IN 1853

Four years later, he went into business for himself, purchasing a gradient section of the Pitten River where he erected a mill for the manufacture of rag pulp. After buying a used paper machine, he went into production. The plant was registered with the authorities in 1853.

QUALITY IS THE PHILOSOPHY

With more than 150 years' experience, Hamburger Pitten represents tradition, corporate culture, and reliability in the paper production sector. At the mill in Pitten 445,000 t/y are produced on the PM3 and PM4.

One of the latest investments was the ANDRITZ film press for the PM4. The PM4 has the following characteristics:

PM4 – KEY FACTS:

- **Capacity: 315,000 t/y**
- **Working width: 5 m**
- **Speed: max. 1,100 m/min**
- **Products: Austroliner 1, 2, 3, Austrotop, SpreeGips Grey, SpreeGips Ivory, Austrowelle, Austrofluting**

Just the two of us

For Hamburger Containerboard in Austria, ANDRITZ converted the machine's old size press into a new design combination film/size press to accommodate different grades of packaging paper. The new press allows machine operators to switch between film-mode or size-mode in less than two minutes. Remarkably, the switch can occur "on the fly" without having to stop the machine.

PM4 in Pitten was put into service in 1978 and has been rebuilt several times. With the last rebuild in 2004, PM4 increased production to 865 t/d of testliner and fluting (100 to 230 gsm). PM4 has a trim of 5 m and a top speed of 1,100 m/min. The weak point in the machine after the rebuild was the size press, which had reached the end of its useful life after being in operation for nearly 25 years.

"We were noticing very high specific steam consumption in the press, says Josef Krenn, Operations Director at the mill. "We could see corrosion on the frame and we noticed vibration at high speeds and low grammage. Roll covers had a very short life of two to three months. It was time for a replacement."

TWO-PHASES OF PROJECT

Krenn and his team began the process of evaluating suppliers for the rebuild of PM4. In their minds, the project had four major targets: energy, starch, quality, and safety. According to Krenn, "On the economic side, our aim was to lower our energy costs and decrease the consumption of expensive starch. On the operational side, we wanted to improve the sheet quality and make the machine safer to operate for our people."

The catching point was how to swiftly and efficiently apply starch to the different basis weight sheets. For paper with a basis weight of more than 170 gsm, Hamburger wanted to use a size press (maximum 11% starch). For other grammages and products, the mill preferred the benefits of a film press (maximum 18% starch). This would allow the mill to reduce the energy required to dry the sheet and increase the speed of production for a lighter sheet in the future.

THE BEST OF BOTH WORLDS

In a typical machine, the size press applies a solution of starch or other material onto the surface of relatively dry paper (in a vat or pond), after which the paper is dried to final moisture content. The starch increases the surface strength of the paper and can also reduce dusting tendencies, increase stiffness, and reduce air permeability.

Because the surface of the sheet is re-wetted in a size press, there is an increased possibility that the web will break. The likelihood of web breakage is considerably greater if the size press is of the traditional "flood" type, in which the sizing is applied by passing the paper web through a vat of starch solution. This is where the film press comes in. The film press applies a precise amount of starch to a press roll, which is then transferred to the paper sheet. More starch can be applied with less water, so the after-drying is more energy-efficient. "We had the desire to have both press technologies available to us on the same machine and within our space requirements," Krenn says. "We asked several suppliers for a proposal on how they would accomplish this."

Faced with this challenge, ANDRITZ engineers looked at their traditional technology in a new way. The target was to efficiently combine the size press and film press in the same basic unit and make it an economically attractive solution.

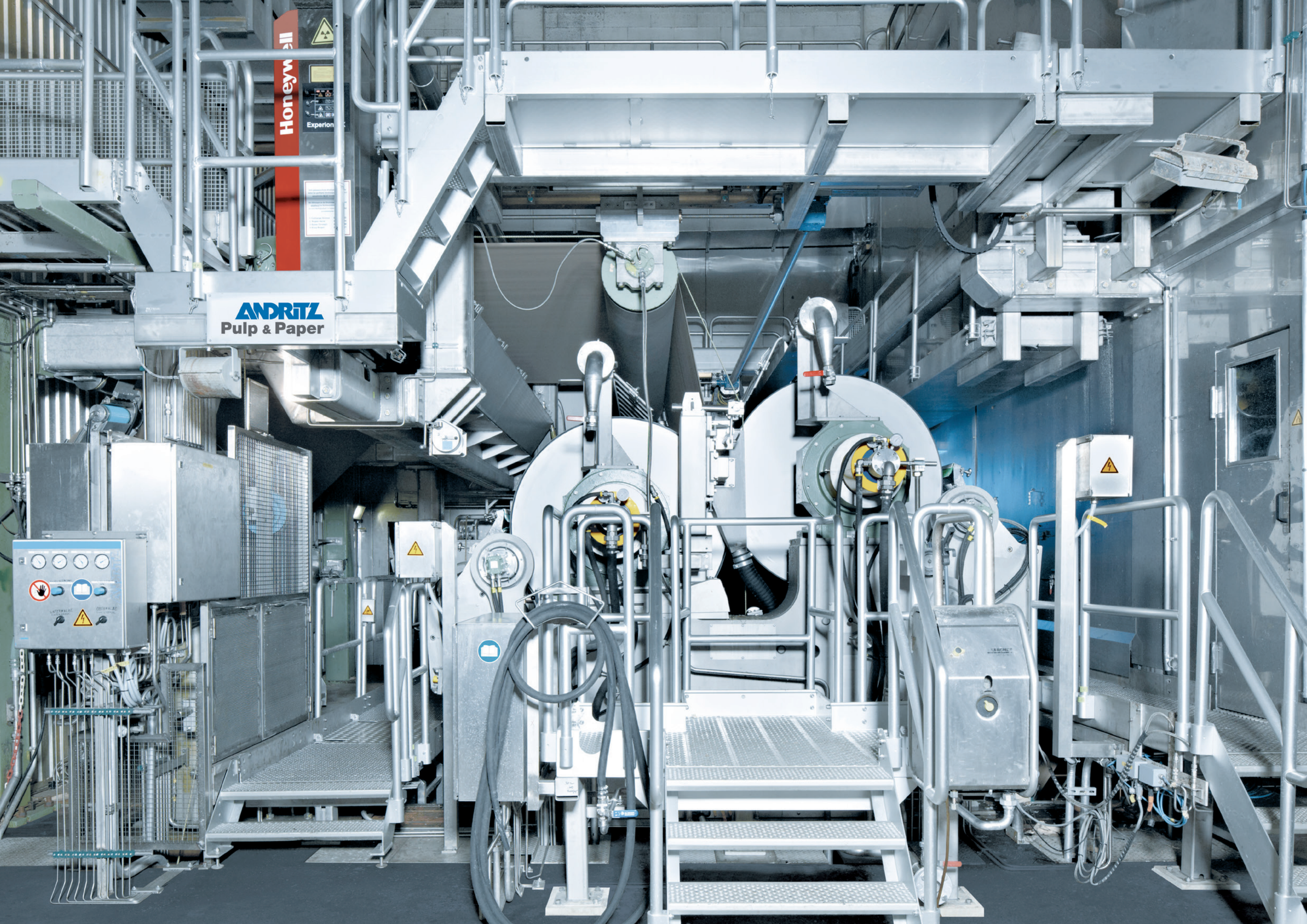
"On the economic side, our aim was to lower our energy costs and decrease the consumption of expensive starch. On the operational side, we wanted to improve the sheet quality and make the machine safer to operate for our people."

Josef Krenn
Operations Director
Hamburger Containerboard Division, Business Unit Brown

ANDRITZ film and size presses are used to apply sizing suspensions and coatings simultaneously to both surfaces of a paper/board web.

The ANDRITZ *Prime*Coat Film is a film press for simultaneous, double-sided coating and/or sizing of paper and board. Different suspensions and weights can be applied on each side. It can also be used for single-sided applications. Due to the compact design, the film press requires very little space and allows a fast change of the applied weight.

The *Prime*Coat Size is a device for simultaneous application of sizing to both sides of paper and board only.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Pulp & Paper

“There are a certain number of unknowns until you actually get in there and dismantle the machinery to see what condition it is in.”

Klaus Aengenendt
Project Manager
ANDRITZ

“We did not have much experience with ANDRITZ in the past, but their concept was sound and we were convinced they could do it,” Krenn says. “They were flexible and willing to regard our wishes, even in the details. This made it easy to come to a decision and sign the contract.”

COMBINATION OF *Prime*Coat Film/*Prime*Coat Size

There are not many combination size/film presses operating in the world. While this is a limitation in terms of experience, it also removes the limitation of being confined by what is considered an industry standard. ANDRITZ was free to take a fresh look.

Within nine months, the ANDRITZ team designed and built its first combination press, joining the technologies of the *Prime*Coat Film and *Prime*Coat Size into one compact unit. “It is certainly not the first combined prime press in the world,” Krenn of Hamburger Containerboard says. “But there are only a few of them in the world, and none with the exact capabilities we were asking for.”

TWO PHASES TO THE PROJECT

The work at Pitten was done in two phases. In August of 2011, Pitten installed a ropeless threading system and other modifications on the machine.

In January 2012, ANDRITZ installed a combined film and size press with a *Prime*Air Glide. Pitten also installed a quality control system for measuring moisture prior to the new press. The work in January required an outage of only 11 days.

Machine rebuilds are always a challenge. Just ask Klaus Aengenendt, Project Manager for ANDRITZ. “There are a certain number of unknowns until you actually get in there and dismantle the machinery to see what condition it is in,” he says. In the case of PM4, some extra work was required due to the framing corrosion.

Machine downtime was less than two weeks. “Reaching this result required hard work and great cooperation on both sides,” says Aengenendt. “We all learned a lot of each other,” Krenn agrees. “It was a very good partnership and communications were clear. We certainly are not ones to be easily satisfied and to always accept the first answer. We need to see solid actions and performance results.”

COMBINED RESULTS

Hamburger has more flexibility in production planning for PM4 and in operating the machine with the new combination press. It is possible to mix the two modes: using the film press for the top side and the size press for the bottom side, for example.

“We are very satisfied with the new film/size press,” Krenn says. “We now have the maximum of flexibility in production, higher speeds, and higher quality. Maintenance accessibility is also pretty good.”

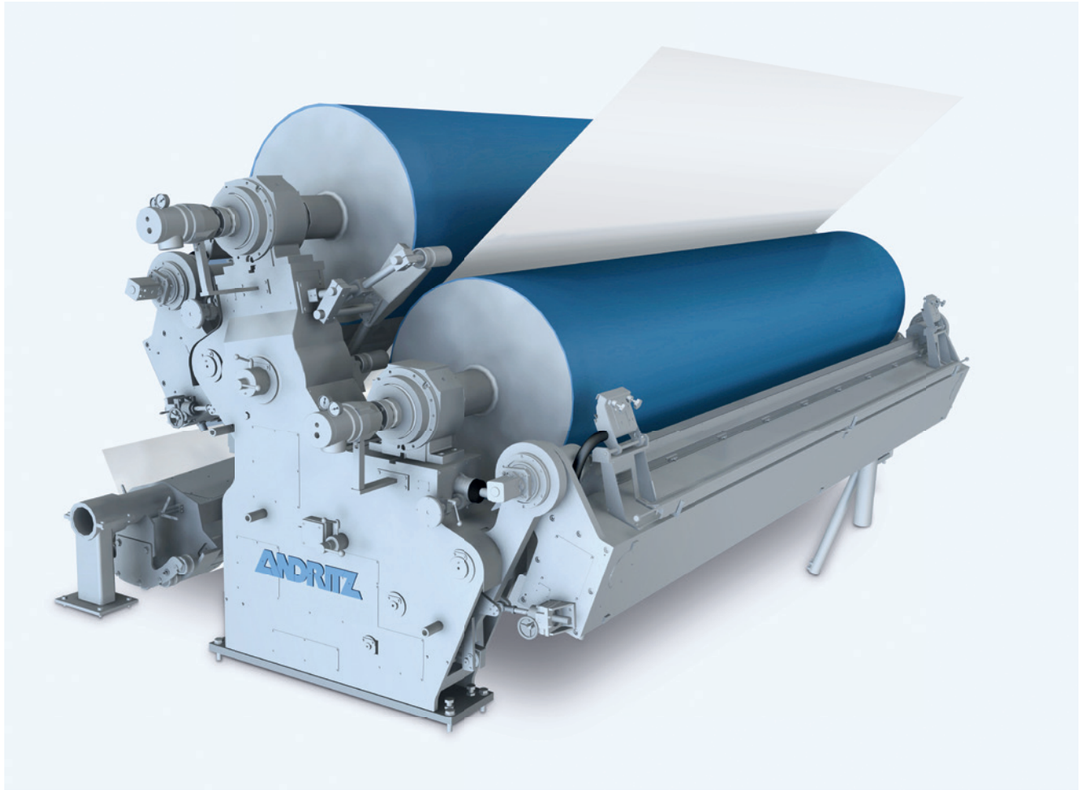
As we all know, even the most meticulous planning and test results in pilot trials can lead to surprises in results from real-life installations. But, in the case of PM4, the surprises were all good.

“When we began to operate the rebuilt machine, we tested the limits of the film press mode,” Krenn says. “To our surprise, the film press actually performs perfectly with heavy testliner up to 230 gsm. This means we can cover our whole product range with the film press. This saves us energy in the drying section due to the higher starch application. Of course, our operators don’t get the fun of switching modes “on the fly” but the economics are important.”

The film press mode significantly reduces starch consumption compared to the old pond-style size press. “The strength values of the sheet are all within specifications after the rebuild and we have been able to reduce dryer steam pressure by two to three bar,” Krenn says. “The energy savings alone are about 10%.” When doing the ROI calculations in the feasibility phase of the project, Hamburger Pitten arrived at an estimated three-year payback, but has realized another pleasant surprise. “We are now seeing that the payback period is significantly shorter than what we estimated,” Krenn says. “Those are the kind of surprises we love to have!”

The new press brings some other notable enhancements. It avoids the waste of starch due to incomplete closure of the nip, which creates sediment in the pond. This sediment can be a major cause of web breaks. Krenn also likes the addition of a new *Prime*Air Glide system with air turn to turn the web on a cushion of air, with a consistent ride height regardless of the web tension.

“We are looking forward to the next project and would certainly consider ANDRITZ again,” Krenn says. “They intrigued us with their initial concept, and convinced us with their project performance, technical expertise, and on-going support.”



3D graphic of the ANDRITZ film press

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