

Gathering impressions – The Murtal region

The market town of Pöls is located in the political district of Murtal in the Austrian federal province of Styria.



Ruin of Reifenstein Castle, © David Bauer

The Murtal region, with its main towns Judenburg, Knittelfeld, Murau, and Pöls, offers several holiday attractions the whole year round. It not only has the picturesque countryside for great adventures in summer and winter, but also Austria's only Formula One race track — the Red Bull Ring in Spielberg — that attracts high-speed fans as well!

The market town of Pöls lies between the southern foothills of the Rottenmanner and Wölzer Tauern and the Seckauer Alps in the valley of the River Pöls. Higher peaks in the surrounding area include the Geigerkogel (1,402 m), the Falkenberg (1,158 m) and the Raningerkogel (945 m). The main industry in Pöls is pulp and paper production and the related wood processing business.

MARKET TOWN PÖLS – KEY FACTS:

- Inhabitants: approx. 2,390
- Size: 33.37 km²
- Main industries: pulp and paper production, forestry



High-speed in the Murtal region at the Red Bull Ring, © Spielberg,

Being part of the Heinzel Group: Zellstoff Pöls AG

The Heinzel Group is one of the largest producers of market pulp in Central and Eastern Europe.



Heinzel Group, Zellstoff Pöls AG

Heinzel Group, which is united under umbrella of Heinzel Holding, is one of the largest producers of market pulp and packaging papers in Central and Eastern Europe with its industrial locations Zellstoff Pöls, Laakirchen Papier (both Austria), Raubling Papier (Germany) and Estonian Cell (Estonia). Magazine paper rounds off the group's range.

Its trading area includes Wilfried Heinzel AG, a globally active pulp, paper and board trading company, and Europapier International AG, the leading paper wholesale company in Central and Eastern Europe. In addition it houses Bunzl & Biach, which is the largest and most important recycled paper company in Austria and a top wholesaler in Central and Eastern Europe. The Heinzel Group's successful growth is based on meeting the highest customer demands with regard to quality and efficiency.

Zellstoff Pöls AG, one of the largest producers of elemental chlorine-free (ECF) bleached softwood sulphate pulp in Central and Eastern Europe, is based in Austria, or more precisely in the federal province of Styria. Its ORION pulp is mainly used to manufacture high-quality printing and writing paper, as well as for magazines, hygiene products, packaging and speciality papers. The STARKRAFT kraft paper is mainly used in packaging and special papers. The bioenergy produced from the wood is fed into the public grid in the form of electricity and district heating.



The Group aims at keeping emissions to a minimum protecting valuable resources, and saving energy.

Paper production at Zellstoff Pöls – Tradition and innovation

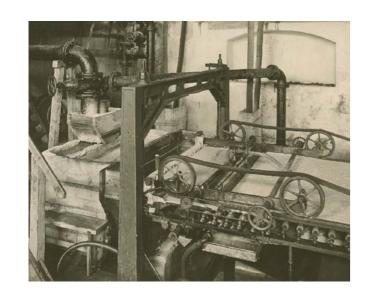
The origins date back to 1700. Since then, the production site has changed frequently in order to fulfill the technological, economic, and ecological demands of the times.

1700

Prince Ferdinand Schwarzenberg established the Reifensteiner Paper Mill in the east of Pöls, directly below Reifenstein Castle.

1910

Start-up of the first industrial paper machine in Pöls (see picture below). Only five years later, industrial production of pulp began in Pöls.



THE PÖLS MILL

Location	Pöls, Austria
Products – pulp	Bleached softwood kraft pulp ORION
Products – paper	Bleached kraft paper STARKRAFT
Capacity – pulp	455,000 t/y
Capacity – paper	200,000 t/y on PM2 and PM3
Main markets	Austria, Italy, Germany, France, Slovenia, Eastern Europe, Mediterranean countries
Main customers	Paper, bag and packaging industry

The Pöls mill in brief

1921

In 1921, Luigi Burgo & Son, the Italian papermakers from Verzuolo, acquired the mill at a time when financial disaster was looming. They were to become the saviours of Pöls. The mill was modernized, and Cartiere Burgo SpA remained a reliable partner who bought pulp even in economically difficult times. In 1961, the first pulp bleaching facility was installed.

1984

In 1984, a major investment helped to launch the sulphate production process, raise capacity by 286%, and reduce the environmental load by 766%. Pöls was a pioneer in using oxygen to delignify pulp and reduce chlorine in bleaching by 50%.

1989 - 1998

The paper mill in Pöls was acquired by Frantschach AG. The sum of 145 million EUR was invested in refining biological wastewater treatment and the bleaching process, as well as in the installation of a new boiler. Only two years later, a biological wastewater purification plant was built. The move to ECF bleaching technology took place in 1995, and in 1998, the new recovery boiler no. 11 was started up successfully.

2000

In 2000, Zellstoff Pöls AG was acquired by the Heinzel Group. Only five years later, the "Pöls 500+" project for capacity expansion was launched. By 2006, the new lime kiln with caustification facility had gone into operation, followed by the installation of a new container tipping facility (2007), a new impregnation tower for wood chips (2008), and the construction of a new 110 kV power line (2009) and a new steam turbine (2010).

"At Pöls, we have a long tradition in paper-making, dating back to 1700. With the PM2, we had the latest available technology installed — a real start in a new dimension."

Jürgen Rieger Paper Production Manager Zellstoff Pöls AG



The start of STARKRAFT production in 2013

2012 - START IN A NEW DIMENSION

In 2012, the PM2 project was authorized. The starting point for the new machine was that Zellstoff Pöls needed to make a strategic decision about how to further develop the Pöls mill location.

"The big question for us was what, in addition to pulp, could we produce that would create or add value?"

Dr. Kurt Maier Former CEO Zellstoff Pöls AG

The investment in a new specialty machine might seem difficult to justify. But one look at the kraft paper segment for food packaging and special purposes leads to a different conclusion. The growth in these segments is estimated to be 2–4% a year. And, unlike publication grades, this segment is not susceptible to competition from the internet, iPad, etc.

After discussion and the creative input of ANDRITZ's engineers, a design was finalized that would produce machine-glazed (MG) white kraft paper for food packaging, carrier bags, gift wrapping paper, as well as industrial, medical, and clinical applications.

With the design and details in hand, Zellstoff Pöls signed the contract with ANDRITZ in May 2012. This set in motion an ambitious plan on the part of ANDRITZ and the mill to deliver, install, and start up a complete paper production line by December 2013.

2013 - STARKRAFT PRODUCTION

On November 10, 2013, the machine was started up successfully one month ahead of schedule and is operating at full speed to produce paper in the range of 28–120 g/m² for various different end applications.







One plus one is more than two: PM2 in 2013, PM3 in 2019

With the additional production line (PM3) production has taken a giant step forward, and Zellstoff Pöls AG is now focusing more than ever on the world market.

2014

Zellstoff Pöls AG won the "Austrian Award for Climate Protection" for the waste heat generated from its pulp production for the past three years that had provided a sustainable, environmentally friendly and regional heat supply for more than 15,000 households in the greater Aichfeld region.

2017

ANDRITZ received the order to supply another large paper machine to produce environmentally friendly MG paper for flexible packaging and release applications.

After a PrimeLine MG paper machine from ANDRITZ, PM2, went into operation back in 2013, another even more powerful machine, PM3, followed in the summer of 2019. With this machine, production took a giant step forward; capacities increased from 100,000 t to 200,000 t of white kraft paper per year. This marked the dawn of a new era for Zellstoff Pöls AG. It had become a global player, marketing its "STARKRAFT" brand across emerging markets worldwide.

ANDRITZ is assisting the company in its aims. "We have a strong intention to achieve together something extraordinary at all levels of cooperation, whether in management or in technology," says Andreas Rauscher, CEO of Zellstoff Pöls AG. "ANDRITZ does not simply supply machines, but also supports us in the role of consultant and system supplier from the first to the last moments of a project. The formula 'one plus one is more than two' really does apply to the relationship between our two companies."

2020

Today, Pöls is technically as well as ecologically one of the most up-to-date plants in the world.



"We have a strong intention to achieve together with ANDRITZ something extraordinary at all levels of cooperation, whether in management or in technology."

Andreas Rauscher Zellstoff Pöls AG





The new PM3: an ANDRITZ solution from the headbox to the reel, including stock preparation, automation and pumps

Facts and figures about PM2 and PM3

PÖLS PM2

Speed	1,200 m/min
Width	5.4 m
Steel Yankee	22 ft. diameter
Capacity	100,000 t/y
Product	kraft paper
Range	28-120 g/m²

PÖLS PM3

Speed	1,400 m/min
Width	5.4 m
Steel Yankee	24 ft. diameter
Capacity	100,000 t/y
Product	kraft paper
Range	20-70 g/m²

Products

bags, shopper, gift wrap or solutions such as flexible packaging paper for the food or pharmaceutical industry or release base papers for hygiene, medical and industrial applications









KEY COMPONENTS IN STOCK PREPARATION:

- Vertical Screw Thickener (VST)
- FibreSolve FSV pulper
- Five TwinFlo disc refiners (see picture above)
- Five-stage cleaner plant
- Five ModuScreen screens in the stock preparation and ShortFlow approach flow system



"Our expectations of the new VST were more than fulfilled. After the fast and trouble-free start-up, we are now already seeing the positive effects, like reduction of sizing agent consumption."

Jürgen Rieger Paper Production Manager Zellstoff Pöls AG

The new Vertical Screw Thickener (VST)

Stock preparation and unique dewatering technology

ANDRITZ installed a similar complete stock preparation line and approach flow system as for the PM2 – with two main differences: The PM3 project features a highly efficient five-stage cleaner plant and innovative new dewatering technology.

Pöls processes two million cubic meters of wood each year, generally with CO₂-neutral production. With a yearly production of 455,000 tons of pulp, the mill is the largest manufacturer of elemental chlorine-free (ECF) bleached softwood pulp in Central and Southeast Europe.

EXCELLENT FIBER PREPARATION

The stock preparation is fed with a mixture of long-fiber pulp from the mill's own pulp mill plant and purchased short-fiber pulp bales. The raw material is dissolved in a FibreSolve FSV pulper, which enables efficient slushing without damage to the fiber. ModuScreen coarse sceening removes heavy particles effectively at high consistency and generates optimum process conditions for the LC refining. Five TwinFlo disc refiners achieve optimum development of fiber properties.

SHORTFLOW APPROACH FLOW SYSTEM

The PMA system features the ANDRITZ ShortFlow concept, which allows a minimized number of equipment items and very low storage volume. Reliable removal of heavy particles – an important precondition for high-quality MG paper – is handled by the five-stage cleaner plant, which was tested previously in the ANDRITZ Stock Preparation Pilot Plant. ModuScreens HBE enable pulsation-free headbox screening immediately before the paper machine.

NEW DEWATERING TECHNOLOGY: VERTICAL SCREW THICKENER

The pioneering Vertical Screw Thickener (VST) is a screw press with a vertical configuration and very small footprint, supporting retrofit installation in an existing building. The vertical design has additional advantages; pulp fed in from above is dewatered by means of gravity and additional mechanically generated pressure. The entire available screening area is fully used from top to bottom – resulting in high efficiency.

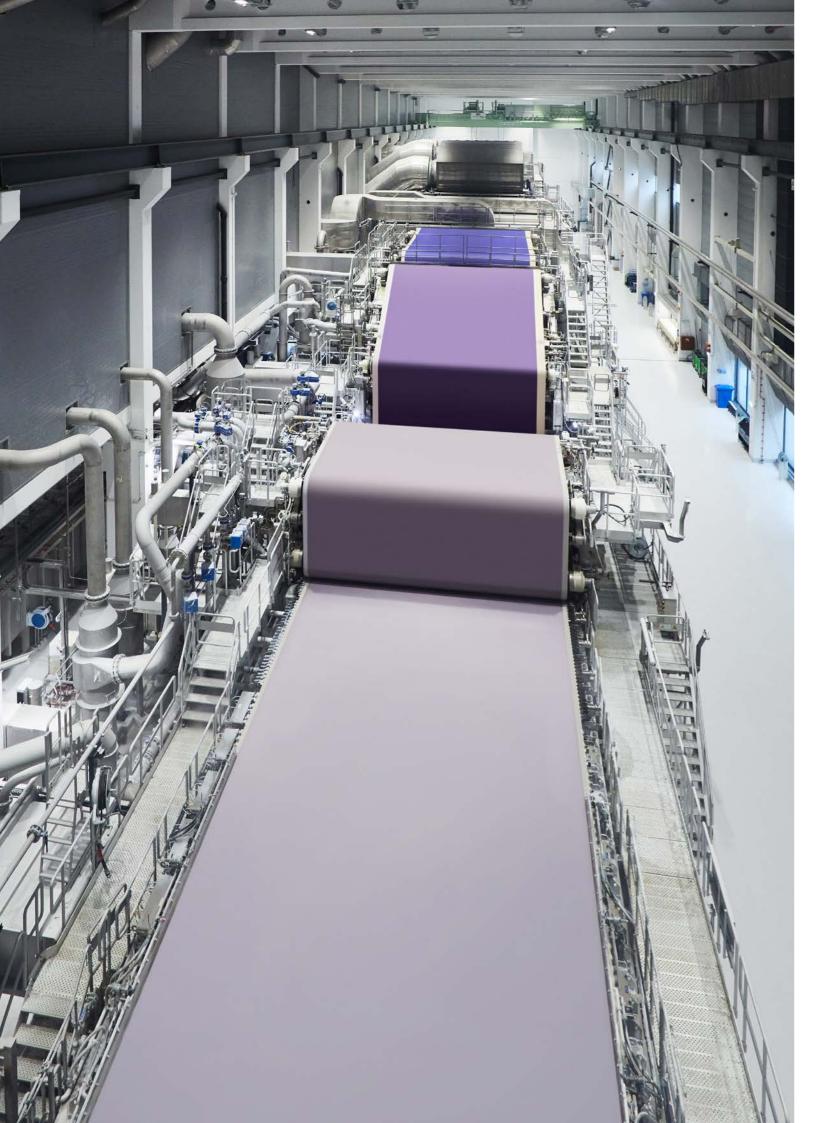
In Pöls, the VST dewaters the pulp from an inlet consistency of 3% to up to 30% at the outlet – a peak value.

And there is a further aspect: The water circuits of the pulp mill and the paper machine are separated from each other. The VST is located just before the storage tower that supplies PM2 and PM3. The filtrate removed from the screw press is returned to the pulp mill where it is reused. The dewatered pulp is then diluted to 12% with hot water from the paper machine. It worked smoothly right from the beginning. This great start is certainly also due to the preliminary tests carried out at the ANDRITZ Stock Preparation Pilot Plant in Graz.

Five-stage cleaner plant for the new PM3







PrimeLine MG paper machine for high smoothness and gloss

The customized concept, which is characterized by a specially designed wire section and a closed draw press, among other elements, is unique.

The configuration of the *Prime*LineMG machine allows flexible production of paper qualities with maximum strength, high printability, and low basis weight.

HEADBOX

The *Prime*Flow headbox has a lamella design and dilution water control to ensure uniform fiber distribution on the wire.

FORMER

The Fourdrinier section is equipped with a PrimeForm HB hybrid former. The hybrid former has a far higher drainage capacity than conventional formers and yields significant beneficial effects on the sheet quality, such as improved formation and improved z-direction distribution of fines and filler. It provides full operational flexibility and optimized handling.

PRESS

The press section utilizes a *Prime*Press Tri X press configuration and transfer belt. This kind of press configuration was developed together with the customer for extremely low basis weights, excellent dewatering and bulk/porosity savings.

PRE-DRYER SECTION

Moisture is reduced further in the *Prime*Dry pre-dryer section that consists of web stabilizers for high runability and steel cylinders for energy-efficient drying.

STEEL YANKEE

The heart of the paper machine is a true giant, made entirely of steel. A diameter of 24 ft. (7.315 m), a shell length of 6.25 m, and a weight of 197 t make the *Prime*Dry MG steel Yankee at Pöls the world's largest. Read more about this unique concept on page 18.

YANKEE HOOD

The *Prime*Dry hood is steam-heated (190° C) using energy from a biomass boiler, thus saving energy and improving the cost efficiency of the drying process.

CALENDER

The compression zone in the *Prime*Cal Soft calender consists of a heated thermo-roll and soft-covered multi HV backing roll. This ensures excellent sheet smoothness and density with an even cross-direction profile.

REEL

In the *Prime*Reel section, the paper is wound onto reels. The turn-up process is fully automated.



"The PM3 is designed for high-quality papers with basis weights lower than 28 g/m². A perfect addition to the PM2!"

Werner Hartmann Managing Director Starkraft Businss Unit of Zellstoff Pöls AG

View of the PM3 from the headbox to the former

Highlights of the Pöls PM3 paper machine

The *Prime*Line MG paper machine is designed for speeds of up to 1,400 m/min. With a working width of 5.4 m, it produces 100,000 t of kraft paper per year.



PrimeForm SW

Fourdrinier former for excellent paper quality and paper uniformity



PrimePress Tri X

Shoe press configuration and transfer belt. Developed together with Zellstoff Pöls AG



PrimeDry Hood

Steam heated MG hood with 190° C temperature. Energy from biomass boiler



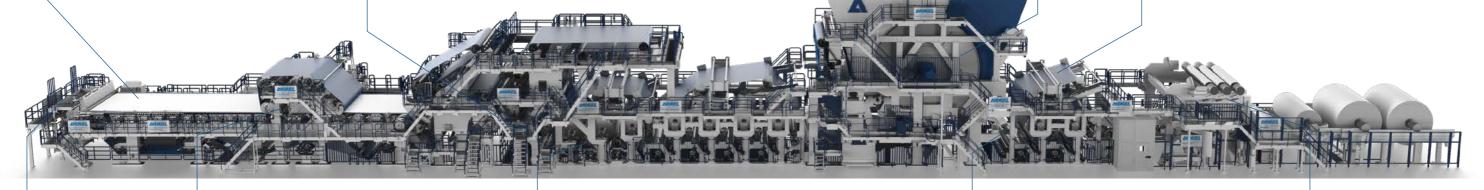
PrimeDry MG

Record size steel Yankee: for efficient drying with



PrimeCal Soft

Soft nip calender with multi HV technology for superior smoothness



PrimeFlow SW

Headbox with lamella technology and consistency profiling system



PrimeForm HB

Hybrid former for excellent formation with optimal dewatering



PrimeDry

Pre-dryer section with double-tier drying group, web stabilizers, and steel cylinders



PrimeDry

After-dryer section with double-tier drying group, web stabilizers, and steel cylinders



PrimeReel

Fully automated turn-up process for diameters up to 3,000 mm









PrimeDry Steel Yankee – The world's giant

ANDRITZ was the only supplier able to manufacture and deliver the centerpiece of the Pöls PM3 with these dimensions: 24 ft. diameter, 6.25 m shell length. Again, after the 22 ft. Yankee for the PM2, a world record!

MANUFACTURE OF A GIANT

A unique, and for cast iron Yankees inconceivable, manufacturing solution was chosen for the new *Prime*Line MG paper machine right away during the project phase. To handle the transport over narrow roads and through tunnels, the Yankee was manufactured in two halves at ANDRITZ Kft. in Hungary and then the two halves were delivered to Pöls, Austria, and assembled on site.

PRECISION TRANSPORT

At the beginning of August 2018, the Yankee began its journey from ANDRITZ Kft. in Tisakécske (south east of Budapest), travelling via Budapest, Nickelsdorf (border crossing between Hungary and Austria), Vienna Schwechat, the Semmering pass, St. Michael, and Judenburg to arrive in Pöls. Manufacturing work had to be scheduled to allow transport at a time when there were no road works along the route used and where there would be no obstructions to normal road traffic. The two halves were transported on trucks 34 m long (the two vehicles were 7.40 m wide and 4.30 m high). The total weight of the loaded vehicles was 334 t. After three days in transport, the two cylinder halves were delivered safely and without incident to the Zellstoff Pöls site.

WHEN TWO BECOME ONE

A few days after arriving in Pöls, the next and most difficult manufacturing step for erection of the world's largest steel Yankee started. The two halves were placed in front of the new paper machine building, one on top of the other with millimeter precision, and the ANDRITZ specialists from Hungary and Austria started a very special welding technique to assemble the two cylinder halves together. After welding, the hollow shaft and other components were installed in the Yankee in a vertical position.

Lifting the giant into the machine hall



Manufacturing at ANDRITZ in Hungary

"Months of pre-preparation, two special trucks, and the patent of ANDRITZ to manufacture the Yankee in two halves, made this transport happen."

> Andreas Rauscher CEO Zellstoff Pöls AG

With the utmost effort, the completely assembled steel Yankee was lifted and rotated into the horizontal with the help of two cranes. Afterwards the steel Yankee was lifted over the roof into the paper machine building and the already prepared machine framing. The finishing work on the Yankee, like grinding and metalizing, was then done once in its working position in the paper machine.

NO LIMITS

There seem to be no limits, regarding Yankee sizes for production. It is transport that restricts size and efficiency visions. Narrow streets, tunnels, as well as transport weight regulations, limit manufacturers in their possibilities. ANDRITZ has accepted the challenge and with the world's largest steel Yankees (22 ft. PM2, 24 ft. PM3) it has proven that its patented concept really pays off.



Fully automated production and high-efficiency pumps

There are a number of considerations as to how paper production can be further optimized, for example, by increasing use of digitally supported tools, Big Data, algorithms, and Machine Learning.

METRIS - ANDRITZ DIGITAL SOLUTIONS

ANDRITZ is a suitable partner with its Metris solutions, all the more so as they are already being used in Pöls in the pulp production process. They can also increase efficiency in papermaking by using sensors to collect and statistically analyze real-time process variables and then implement improvements directly in operations.

FULLY AUTOMATED LINE CONTROL

All paper making segments, namely stock preparation, headbox with dilution control, press section performance, drying, and reeling, are automatically monitored by the system. All sub-systems are integrated into one operator-friendly control interface, thus offering comprehensive diagnostic and fault finding while meeting ergonomic requirements.

COMPREHENSIVE PLANT SUPERVISION

The control system touches every piece of equipment and instrument in the plant. Nothing is conveyed, ground, classified, pumped, processed, calcined or dried until the plant's "nervous system" is operationally ready. In short, control of the mill can mean the difference between profit and loss.

HIGH-EFFICIENCY PUMPS

All process pumps, including units from the proven ACP series, were delivered by ANDRITZ. The headbox pump from the ASP series, the most important pump for PM3, features a very high efficiency of 92% and lowest pulsation to guarantee perfect sheet formation.

METRIS: FORESEE DIGITALLY

ANDRITZ pools its many years of experience in the plant business to develop smart, attractive and seamlessly integrated solutions for existing and new plants under the brand Metris. The technologies are aimed at digitalizing and networking.



"Innovation and technological developments are essential in order to achieve good performance and integrated automation."

Gerhard Schiefer Vice President Global ANDRITZ Automation ANDRITZ AG

View of reel section of the PM3



Europe's largest new MG machine in operation

PM3 went into operation at the end of May 2019, two weeks before the scheduled project date, and has since been producing kraft paper for a wide range of packaging applications as well as release papers.

With an annual capacity of 100,000 t, a design speed of 1,400 m per minute, and a working width of 5.4 m, it is the largest machine of its kind in Europe.

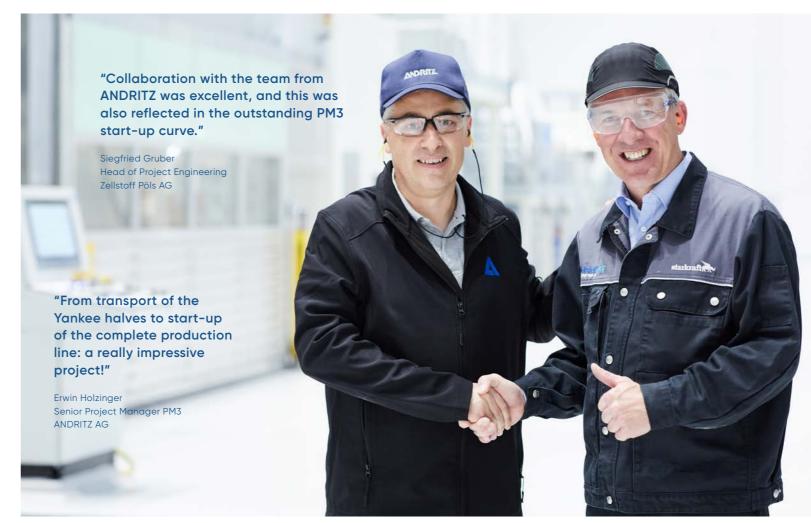
SETTING A NEW BENCHMARK

The ANDRITZ *Prime*Line MG plant produces environmentally friendly MG paper for flexible packaging and release applications at the Pöls location (see next pages as well). PM3 is setting a new benchmark in the production of these paper grades. The unique machine design enables the production of grades with low basis weight and highest strength with good printability and smoothness levels.

EXCEEDING ALL EXPECTATIONS

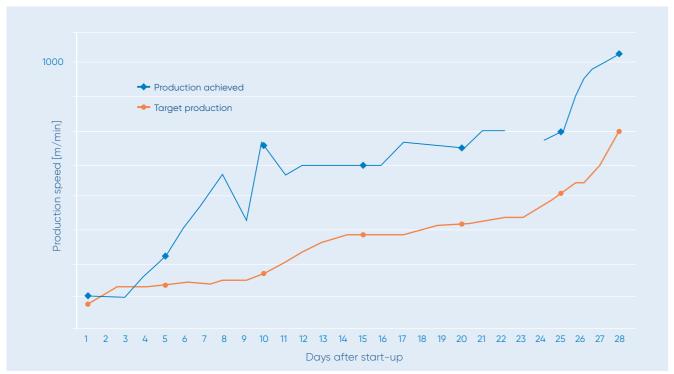
In terms of production and final product quality, PM3 exceeded all expectations right away in the first four weeks after start-up.

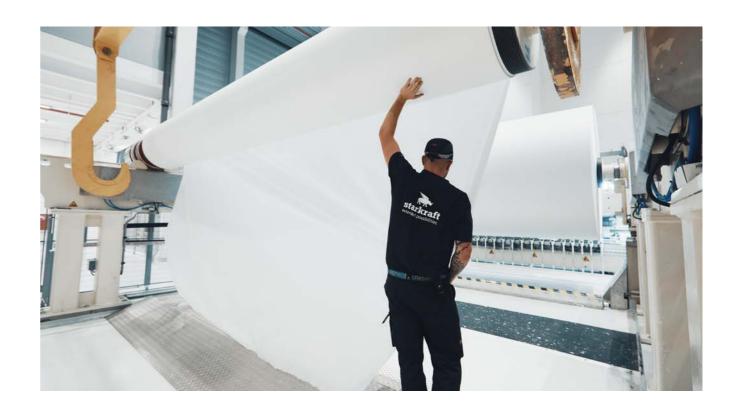
The design capacity was achieved in stable operation within three months, and the majority of paper grades with basis weights between 22 and 52 g/m 2 were produced successfully.



Erwin Holzinger (left) and Siegfried Gruber (right) in front of the new PM3

Start-up curve: first four weeks ramp-up





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Flexible production for a broad product range

The origins date back to 1700. Since then, the production site has changed frequently in order to fulfill the technological, economic, and ecological demands of the times.

For over three hundred years, paper has been produced in the village of Pöls. All these years of experience, combined with innovative technology, lead to a production process and strategy that is based on four pillars: responsibility, sustainability, transparency, and trust. The paper fullfills the end customers' requirements, and the new paper machines are state-of-the-art technology with maximum energy efficiency. The product information is prepared to ensure that customers find all the details at a glance. As a privately owner-managed company, Pöls continually invests in projects that ensure long-term employment in the region – construction of the new paper machines is an excellent example.

SUSTAINABILITY OF NATURAL RESOURCES

In accordance with growing awareness of the limited supply of raw materials and energy sources, Zellstoff

Pöls is committed to prudent use and sustainable safeguarding of the required natural resources, other production and auxiliary materials, as well as water, air, and energy.

One of the most important resources is wood, a natural product. It serves as the raw material needed to produce pulp and paper, but it is also first and foremost a provider of energy. Zellstoff Pöls comprehensively takes the high value creation derived from the material and bioenergetic use of wood into account. 95% of the CO₂ emissions arising from the production process consist of biogenic or neutral CO₂. This makes a considerable contribution towards avoiding harmful greenhouse gas emissions. Moreover, the paper and board manufactured from Pöls products is 100% recyclable and compostable, thus making a decisive contribution towards sustainability.



BAGS

STARKRAFT BAGS have been developed to package and protect food items in a natural and environmentally friendly manner. They protect high-quality everyday products – where each product has its own requirements.



STARKRAFT SHOPPER is the quality kraft paper for shopping bags that scores highly with its strength and printability.



STARKRAFT GIFTS is the multi-purpose paper, not only for flowers and presents. Its smooth surface and high mechanical strength make it the optimum choice for end product

processing.



FORMFILL

STARKRAFT FORMFILL is the best paper for automated filling processes and meets all requirements set by the food packaging regulations. The paper is used for the packaging of flour and other food products.



MEDICINE

STARKRAFT MEDICINE is the special paper used in the manufacture of high-quality medical and clinical packaging solutions. It is produced according to strict quality standards that are in line with the exclusive and very demanding medical packaging requirements.



FLEXPACK

STARKRAFT FLEXPACK is used for the packaging of food products. It can be printed, laminated, or coated, depending on the application and specification required. This packaging material is used for items such as soups, sauces, confectionery, dairy products, or coffee and tea.



FLEXPACK SMOOTH

STARKRAFT FLEXPACK SMOOTH is a bleached, calendered kraft paper with very good formation and high strengths. It is designed for multi-layer laminating and coating applications.



RELEASE

STARKRAFT RELEASE is an uncoated base paper for direct siliconization. It can be used as a reliable and easily releasable cover for self-adhesive strips and in various hygiene applications.



DISCOVER OUR FULL-RANGE PORTFOLIO FROM FIBER PROCESSING TO PAPERMAKING

An outstanding paper product requires outstanding production – matched with the particular needs of the raw material and final product. Discover the full-range portfolio from ANDRITZ: Excellent stock preparation that allows best fiber development according to furnish and with economical use of resources. *Prime*Line paper machines that are a synonym for producing top-quality tissue, paper, and board grades. Complete lines or single units, upgrades, and modernizations. Contact us and benefit from your individual package in papermaking technology.

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