

## SUCCESS STORY

Europe's largest new KRAFT paper machine. A *PrimeLine* MG paper machine for high smoothness and gloss.



PULP & PAPER

# MILL STORY

ZELLSTOFF PÖLS AG, PÖLS PM2, AUSTRIA

**ANDRITZ**

ENGINEERED SUCCESS



# 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. There is not just 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, Wölzer Tauern and Seckauer Alp mountains 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 the pulp and paper production and the related wood processing business.

## MARKET TOWN PÖLS – KEY FACTS:

- Inhabitants: approx. 2,390
- Size: 33.37 km<sup>2</sup>
- Main industries:  
pulp and paper production, forestry



High-speed in the Murtal region at the Red Bull Ring, @ Spielberg, Erwin Polanc

# Being part of the Heinzl Group: Zellstoff Pöls AG

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



Heinzl Group, Zellstoff Pöls AG

The Heinzl Group, which is united under the umbrella of Heinzl Holding, ranks together with its subsidiaries Zellstoff Pöls AG and AS Estonian Cell and its participation in Biocel Paskov a.s. among the largest producers of market pulp in Central and Eastern Europe.

The Group's trading division includes Wilfried Heinzl AG, a globally active pulp and paper trading company, and Europapier AG, the leading paper merchant in the CEE region. The Group's successful growth is based on the fulfillment of 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.

ORION pulp, the brand name under which Pöls pulp is sold, is mainly used to manufacture high-quality printing and writing paper, tissue paper, as well as packaging and special paper.

An integrated paper machine produces bleached kraft paper. This STARKRAFT paper is applied primarily in the production of packaging and special applications.



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



# Paper production at Zellstoff Pöls – Tradition and innovation

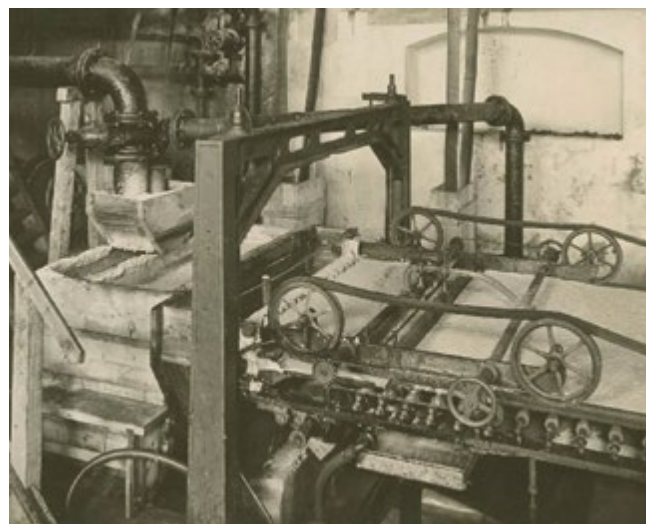
The origins date back to 1700. Since then the production site has changed frequently in order to fulfill the technological, economic, and ecological demands of the times.

## 1700

Prince Ferdinand Schwarzenberg establishes 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.



## 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, an investment of approx. 250 million USD 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 Pöls was acquired by Frantschach AG. The sum of 145 million euros 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.II started-up successfully.

**“At Pöls, we have a long tradition in papermaking, dating back to 1900. With the PM2, we have the latest available technology installed – a real start in a new dimension.”**

Jürgen Rieger  
Chief Operating Manager Pöls PM2  
Zellstoff Pöls

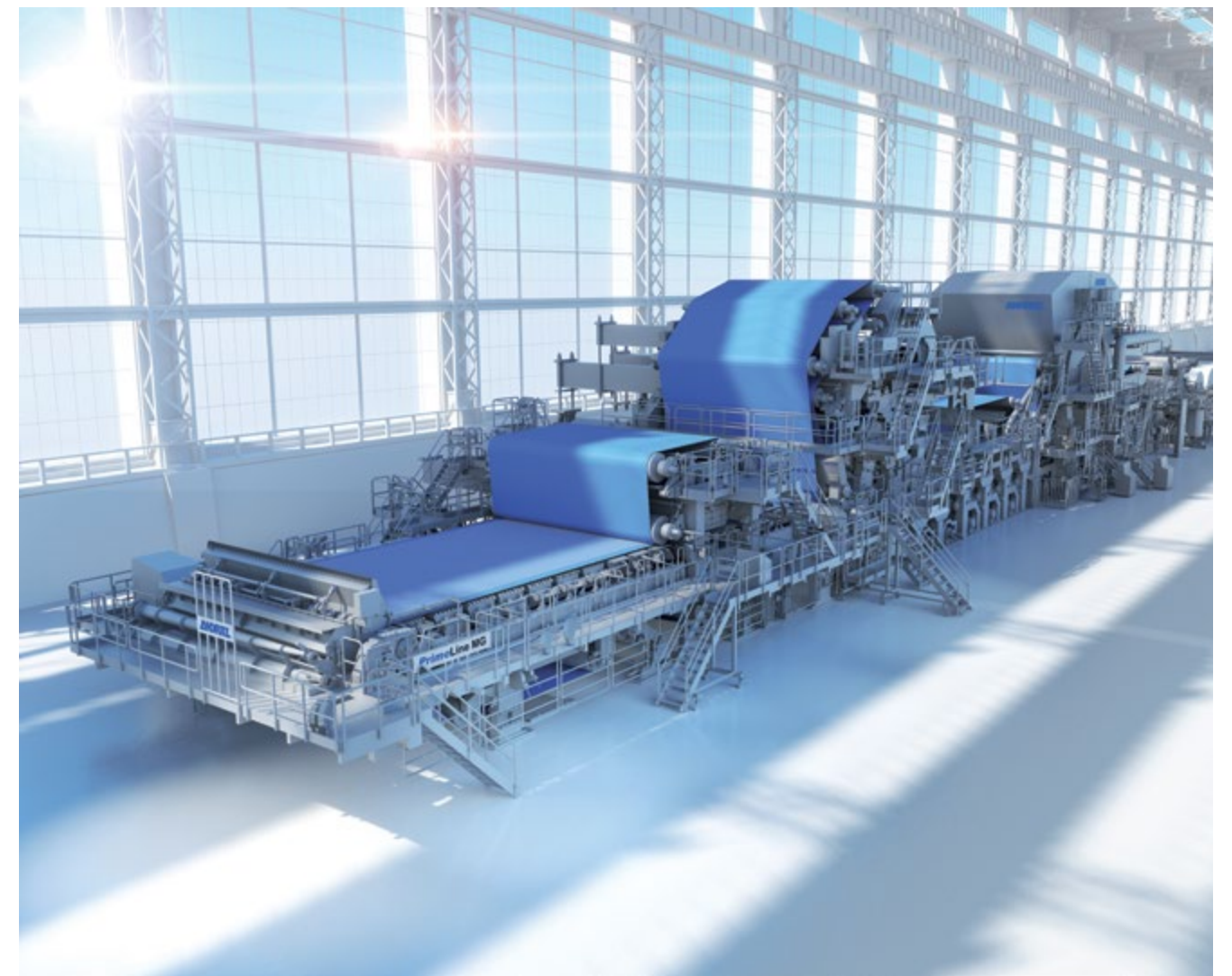
## 2000

In 2000, the Zellstoff Pöls AG was acquired by the Heinzl Group. Only 5 years later, the “Pöls 500+” project for capacity expansion was launched. By 2006, the new lime kiln with caustification facility was put 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).

## THE PÖLS MILL

Location	Pöls, Austria
Products – pulp	Bleached softwood kraft pulp ORION
Products – paper	Bleached kraft paper STARKRAFT
Capacity – pulp	410,000 t/y
Capacity – paper	14,000 t/y on PM1, 80,000 t/y on PM2
Main markets	Austria, Italy, Germany, France, Slovenia, Eastern Europe
Main customers	Paper, sack, and packaging industry

The Pöls mill in brief



3D graphic of the new MG paper machine PM2

## 2012 – START IN A NEW DIMENSION

In 2012, the project PM2 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  
CEO  
Zellstoff Pöls

The investment in a new specialty machine might seem difficult to justify. But one having a 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/m<sup>2</sup> for various different end applications.





**A STAR IS BORN** / Europe's largest new  
KRAFT paper machine





In the long-fiber line, a gravity table is used for pulp thickening, in order to reduce the volume of the subsequent storage tower. This is a new application for the ANDRITZ gravity table, which is typically used for sludge dewatering.

# Stock preparation and pumps – Unique application and patented pump solution

For the first time in paper production a gravity table, normally used for pulp thickening, was installed and the headbox pump operates at an impressive 92% efficiency!

With a length of more than 157 m and a width of 33 m, the new paper machine hall is approximately the size of a soccer field. The equipment is installed on three levels: Level zero houses the pumps and the two stock preparation lines.

### OWN PULP FOR PAPER PRODUCTION

One stock preparation line processes long-fiber pulp produced at the Pöls mill, while the other one is fed with purchased bales for short-fiber pulp.

The Pöls pulp mill produces 410,000 t/y and is the largest manufacturer of elemental chlorine-free (ECF) bleached softwood pulp in Central and Southeast Europe. The pulp mill processes two million cubic meters of wood each year, generally with CO<sub>2</sub>-neutral production.

### A PROTOTYPE'S SUCCESS

At the Pöls PM2 paper machine, a newly developed medium-consistency pump was installed without vacuum pump. It features an efficiency of 70%, which is well above industry average. The world-wide first pump of the new MC series was installed at the pulp line in Pöls in 2007 as a prototype and has been operative since then. Since then the MC pump has been continuously updated and the innovative, patented SMARTSEP system was created in order to avoid fiber loss at any consistency and to simplify control. The air is removed from the pump by a separation impeller, and the fibers removed with the air are returned safely to the pump at the same time. This guar-

antees that there is no fiber loss at any time, and control of the degassing valve is incredibly simple (pump running = valve open; pump not running = valve closed).

### NEW APPLICATION

In the long-fiber line, ANDRITZ installed a gravity table for pulp thickening. The gravity table increases consistency from four to eight percent, allowing Pöls to save money by building a smaller storage tower. Separate refining lines for the long and short fibers are employed, though both use ANDRITZ TwinFlo double-disc refiners. Stock blending is performed in the ANDRITZ paper machine approach system.

### HIGH-EFFICIENCY HEADBOX PUMP

All centrifugal pumps, including 30 units from the new ACP series, were delivered by ANDRITZ. The headbox pump, the most important pump for PM2, features a very high efficiency of 92% and lowest pulsation to guarantee perfect sheet formation.



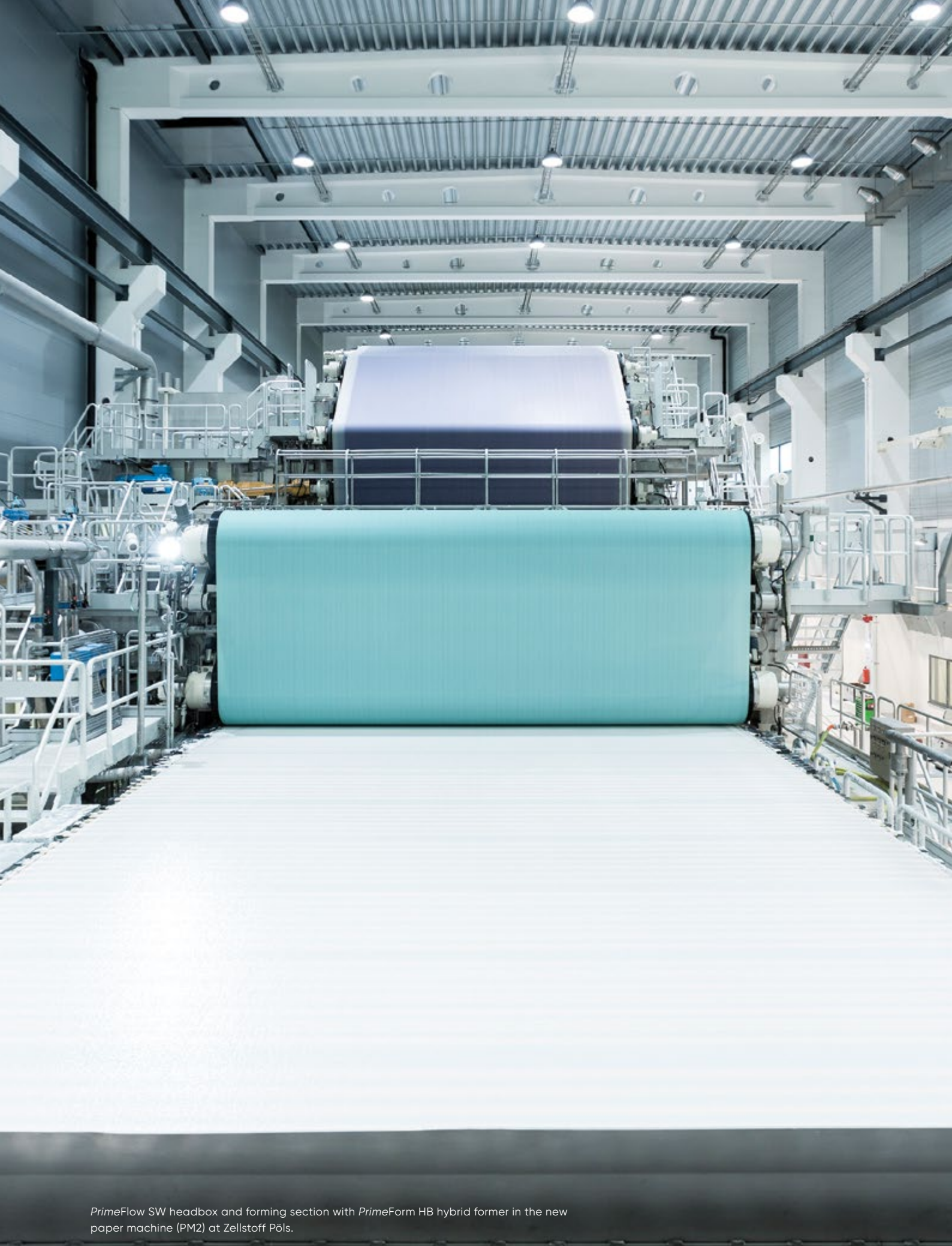
PM2's new generation MC pump with patented SMARTSEP technology.

**"We installed the MC pump, switched it on, and have never had to give it another thought since then."**

Siegfried Gruber,  
Head of Project Engineering,  
Zellstoff Pöls, about the MC  
prototype pump installed at the  
pulp line already in 2007.







PrimeFlow SW headbox and forming section with PrimeForm HB hybrid former in the new paper machine (PM2) at Zellstoff Pöls.

# PrimeLine MG paper machine For high smoothness and gloss

The *PrimeLine* MG paper machine has the capacity to produce over 1,000 m of high-quality paper, called “STARKRAFT”, per minute and features several technical highlights.

## HEADBOX

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

## FORMER

The Fourdrinier section is equipped with the newly developed ANDRITZ *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 compact, two-nip *PrimePress* with a shoe press module (X-nip technology with HV-Smart counter roll) for very gentle dewatering.

## PRE-DRYER SECTION

Moisture is reduced further in the *PrimeDry* pre-dryer section that consists of vacuum rolls and web stabilizers for high runability. The pre-dryer section is of single- and double-tier design.

## STEEL YANKEE

The heart of the paper machine is a true giant, completely made of steel. A diameter of 6.7 m, a shell length of 6.25 m, and a weight of 150 t make the *PrimeDry* MG steel Yankee at Pöls the world's largest. Read more about this unique concept on page 15.

## YANKEE HOOD

The *PrimeDry* hood is steam-heated (160° 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 *PrimeCal* 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 *PrimeReel* section, the paper is wound onto reels. The turn-up process is fully automated.

## WINDER

The *PrimeWinder* Arcus Evo, a two drum winder, converts the jumbo rolls into the sizes required for the different end uses. Pöls produces rolls with diameters from 700 to 1,400 mm and a width of up to 3,200 mm.

## PÖLS PM2

Speed	1,200 m/min
Width	5.4 m
Capacity	80,000 t/y
Product	kraft paper
Range	28-120 g/m <sup>2</sup>
End application	bags, shopper, gifts, formfill, medicine, flexpack

Pöls PM2, technical facts



*PrimeWinder* Arcus Evo and *PrimeReel* section: The reel's primary arm is equipped with spool weight compensation, and the whole turn-up process is fully automated.



# Pöls PM2 MG paper machine – The highlights in brief

The *PrimeLine* MG paper machine is designed for speeds of up to 1,200 m/min. With a working width of 5.4 m, it produces 80,000 t of kraft paper per year.



## PrimeForm SW

Fourdrinier former for excellent paper quality and paper uniformity



## PrimePress

Compact two-nip press arrangement with shoe press module for high nip loads



## PrimeDry Hood

Steam heated MG hood with 160°C temperature. Energy from biomass boiler



## PrimeDry MG

Record size steel Yankee: 22 ft. diameter, 6.25 m shell length. Efficient drying with steel

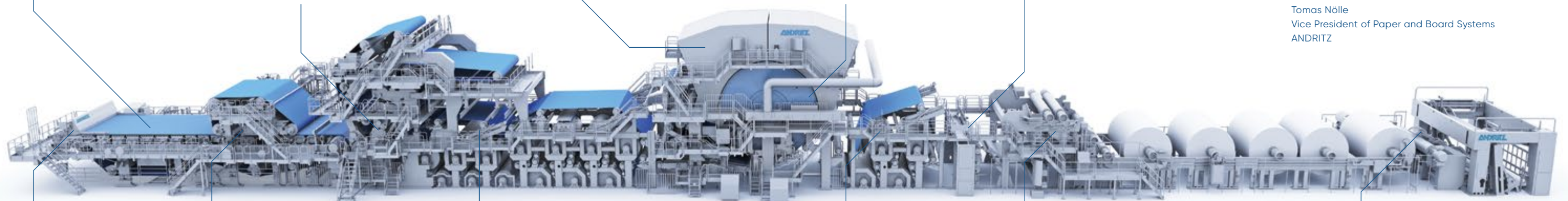


## PrimeCal Soft

Soft nip calender with multi HV technology for superior smoothness

“Pöls wanted to produce a variety of grades on the same machine. The wish was for a machine similar to PM1, but with a capacity over five times higher and with the ability to produce grades for a broader customer base. The number and type of grades was one of the biggest design challenges from the very start. They required an extremely agile machine, it had to be able to switch grades in an instant to minimize waste and keep machine efficiency high. A great value is placed on being able to meet customer demand without building excess inventory.”

Tomas Nölle  
Vice President of Paper and Board Systems  
ANDRITZ



## 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 single- and double-tier drying groups, equipped with vacuum rolls and web stabilizers for high runability

## PrimeDry

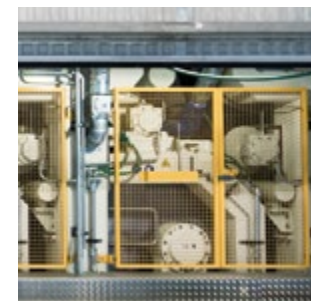
After-dryer section with double-tier drying group, vacuum rolls, and web stabilizers

## PrimeReel

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

## PrimeWinder Arcus Evo

Unwind station and two drum winder for excellent winding results and high speeds





# PrimeDry Steel Yankee – The world's giant

ANDRITZ was the only supplier able to manufacture and deliver the centerpiece of the Pöls PM2 with these dimensions: 6.7 m diameter, 6.25 m shell length.

A diameter of 6.7 m, a shell length of 6.25 m, and a weight of 189 t make the steel Yankee for Pöls the largest welded, high-precision Yankee in the world.

## MANUFACTURE OF A GIANT

Already during the project phase of this new PrimeLine MG paper machine a unique, and for cast iron Yankees inconceivable, manufacturing solution was chosen. 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. At the end of July 2012, procurement of the materials began, and right on schedule, after an 8 months manufacturing period including rolling, welding and surface treatment, the two halves were ready for dispatch.

## PRECISION TRANSPORT

At the beginning of March 2014, the Yankee began its 630 km journey from ANDRITZ Kft. in Tisakécske (southeast of Budapest), travelling via Budapest, Nickelsdorf (border crossing between Hungary and Austria), Vienna Schwechat, Graz, the Gleinalm highway tunnel, St. Michael, and Judenburg to arrive in Pöls. Manufacturing work had to be scheduled to allow transport at a time that 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 22 m long (the two vehicles were 6.72 m wide and 4.5 m high). The total weight of the loaded vehicles was 224 t. After a three days transport time, the two cylinder halves were delivered safely and without incident to the Zellstoff Pöls area.

## WHEN TWO BECOME ONE

A few days after arriving in Pöls, the next and most difficult manufacturing step for the 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 into the Yankee in a vertical position. With the utmost effort, the completely assembled steel Yankee, with an overall weight of 189 t, was lifted and rotated into the horizontal with the help of 2 cranes – one of them with a loading capacity of 1200 t. 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

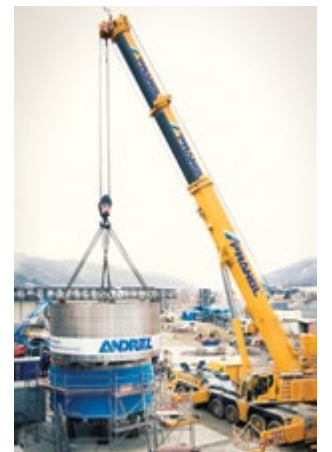
There seem to be no limits, regarding Yankee sizes for production. It is transport that restricts size and efficiency visions. Narrow streets, tunnels, as well as transport weight regulations, limit manufacturers in their possibilities. ANDRITZ has accepted the challenge and with the world's largest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



Manufacturing at ANDRITZ in Hungary



High precision in transport



Two become one: on-site assembly at Pöls



Lifting into the machine hall

PrimeDry Steel Yankee lifted into the machine hall at Pöls.



# Fully automated production process Integrated automation for the Pöls paper mill

The instrumentation, electrification, and automation systems in the PM2 contribute to safe and efficient operation and to the optimum use of natural resources.

For the PM2, ANDRITZ installed the complete control system for the stock preparation plant, the paper machine itself including the winder, and the associated drive and QCS system. The engineering, coordination, and commissioning of automation, electrification, and instrumentation were included as well.



Tailored electrification equipment

The control systems were tested in advance in close cooperation with paper experts and the customer himself to ensure a fast and smooth start-up.

## FULLY AUTOMATED LINE CONTROL

All paper making segments, namely stock preparation, headbox with dilution control, press section performance, drying, reeling and winding, 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, the control of the mill can mean the difference between profit and loss.

## REMOTE MONITORING

Pöls is served with permanent remote monitoring. The operators receive continuous assistance during their daily work.

## OPERATOR TRAINING

In addition, ANDRITZ offers proven solutions for industrial training that provide the workforce with realistic, hands-on training modules.

The web-based training program provides an effective and measurable form of training for the personnel, using pictures, animation, graphics, sound, and text.



Fully automated tambour change that minimizes maintenance.

View of the control room of the Pöls PM2 MG paper machine



# The Rhino has landed – Flexible production based on customer needs

Zellstoff Pöls has created a symbol for its new PM2, the Flying Rhino, which stands for strength (company and product strength) and flexibility.

The Rhino's ability to fly shows an agility to respond to the grade, delivery, and quality requirements of Pöls' customers. Strong, adaptable, and agile: characteristics that can also be applied to the ANDRITZ PM2 technology.



**“Holding paper in my hands was a physical proof that our hard work and excellent cooperation over many months paid off.”**

Siegfried Gruber  
Head of Project Engineering  
Zellstoff Pöls

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

## SUSTAINABILITY OF NATURAL RESOURCES

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

stoff Pöls is committed to the 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 percent of the CO<sub>2</sub> emissions arising from the production process consist of biogenic or neutral CO<sub>2</sub>. This makes a considerable contribution to the avoidance of harmful greenhouse gas emissions. Moreover, the paper and board manufactured from the Pöls products is 100% recyclable and compostable, thus making a decisive contribution to sustainability.



**“Our message to customers is that we are a strong partner, ready to add value whenever white kraft paper can provide a good solution.”**

Werner Hartmann  
Managing Director  
Zellstoff Pöls



## BAGS

STARKRAFT BAGS have been developed to pack and protect food items in a natural and environmentally friendly manner. They protect the high-quality daily life products – with each product having its own requirements.



## GIFTS

STARKRAFT GIFTS is the all-round paper that suits perfectly not only for flowers and presents. Its smooth surface and high mechanical strength make it the optimum for end product processing.



## SHOPPER

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



## 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. Nowhere else is it so important to achieve the highest possible strength, guaranteeing high-speed filling, with the lowest possible basis weight.



## 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 from the pharmaceutical industry and hospitals.



## 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.





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