



PULP & PAPER

*PrimeLine*  
**PAPER AND BOARD  
MACHINES**

SAVING RESOURCES



**ANDRITZ**

ENGINEERED SUCCESS



## ENGINEERED SUCCESS

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### *PrimeLine*

complete lines, rebuilds, and upgrades for the production of all kinds of paper and board



# High-tech solutions for efficient production

As with many energy- and investment-intensive industries these days, the paper and board industry is facing increasing pressure to remain cost-competitive as well as having to reduce consumption of resources.

## FACING CHALLENGES

Every paper and board producer faces an endless stream of challenges – tons of paper/board to be produced most economically in the quality required, lowest maintenance costs and zero unplanned shutdowns, staying below environmental limits, and so on. In recent years, a lot has been invested in new machines as well as major machine rebuilds to produce packaging grades instead of graphic papers. As a result, there is more production capacity installed today than is required to meet demand, which puts some pressure on our customers and on ourselves to come up with new cost-efficient solutions. The paper machines with the best combination of good paper quality and low costs will most certainly prevail.

With the latest technologies and solutions, which are innovative, efficient, and minimize consumption of raw material and resources, ANDRITZ contributes towards improving your operations, without compromising on product quality thanks to the well proven technologies.

## DIGITALIZATION

We are also convinced that new control systems will help to make production more reliable, more predictable and more cost-efficient based on the actual equipment installed. All such control and automated process optimizations are developed and implemented under the brand name Metris and will play a major role in every new paper and board machine or rebuild in the future. Listening to the needs of our customers and coming up with tailored solutions for best fit will enable us continue our success. This is our commitment.

## ENGINEERED SUCCESS

We at ANDRITZ are in the business of helping you meet those challenges head-on. We have the technical know-how, experience, and passion to do so. Once committed, we deliver on our promises. This brochure is a compilation of product information and success stories about paper and board machines. We hope you enjoy exploring our broad range of capabilities, and we look forward to excellent cooperation!

# Organic growth through acquisitions

The acquisition of companies with complementary products or technologies is one of the main cornerstones of ANDRITZ to provide the best possible solutions to its customers.

## COMPLETE PRODUCT RANGE

We can supply processes and equipment from the woodyard to finished paper production, including the pulp mill, recycled fiber processing, stock preparation, approach flow, paper machines for grades including cartonboard, containerboard and specialty papers, pumps, automation, and some components for graphical paper machines. In 2016, ANDRITZ opened up a new location in St. Pölten, Austria, where experts in technology, engineering, automation, processes, and applications are strengthening our capabilities. In the same year, ANDRITZ acquired a 100% stake in SHW Casting Technologies, Torrington, USA. The company is engaged in supplying the paper industry for the eastern American and the southern Canadian regions.

## ANDRITZ PAPERCHINE

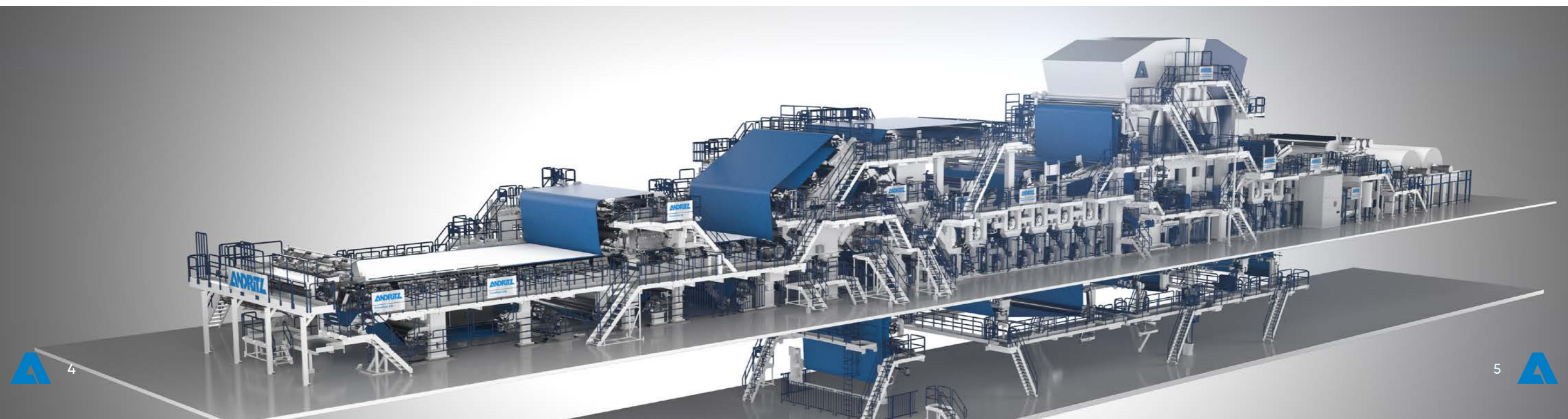
In 2017, ANDRITZ acquired Paperchine, Charleston, USA. Paperchine and its subsidiaries operate manufacturing facilities in the USA, Canada, Thailand, and Germany.

With its 180 employees in multiple locations ANDRITZ Paperchine is well positioned to provide technical and mechanical services in support of paper machine maintenance and troubleshooting – as well as the technical auditing and design work required for machine rebuilds, conversions, or upgrades.

## ANDRITZ NOVIMPIANTI

In 2018, ANDRITZ acquired the Italian company Novimpianti to further strengthen its product offerings in the field of air and energy systems, mainly for paper, board, and tissue machines.

The company provides the paper and board industry with innovative, heavy construction, competitive, and eco-friendly hoods, steam-condensate systems, heat recovery units, mist elimination, and ventilation systems – for new machines or modernizations of existing machines.





**PrimeForm TW  
GAP FORMER** installed at Laakirchen  
Papier AG, Austria

# Tradition meets innovation – Key components and complete lines

What started as a much narrower niche a decade ago (tissue machines and paper machine approach systems) has expanded into our full-line supply of solutions and services to the paper and board industry.

## LICENSEE

In the 1950s, ANDRITZ was a licensee for paper machines designed by Escher Wyss.

## FIRST COMPLETE MACHINES

The first complete paper machines from ANDRITZ were installed in the 1990s. In 1991, we installed our first coated board machine (FS Karton, Germany). In addition, an Asian Pulp and Paper producer ordered four new board machines, each with a capacity of 200,000 t/a.

## RENEWED PAPER AND BOARD FOCUS

After a strong focus on tissue machines from 1996 to 2004, ANDRITZ reentered the paper and board market in 2005. The product portfolio was strategically renewed through internal design developments and expanded through acquisitions in order to become a full-line supplier.

## SHOE BLADE GAP FORMING

Shoe blade gap forming was first introduced by ANDRITZ in 2004. Initial applications focused on publication grades.

ANDRITZ started the first shoe blade former producing linerboard in the industry in 2011. The current shoe blade gap forming portfolio covers publication grades as well

as line and medium over a wide speed and basis weight range.

## FIRST SHOE PRESS

The first *PrimePress* X shoe press was sold in 2006. Today, there are more than 80 references worldwide.

## FIRST FILM PRESS

Following the successful installation of the first film press in 2007, additional 10 *PrimeFilm* presses have been installed worldwide.

## WORLD RECORDS WITH STEEL YANKEES

In 2008, ANDRITZ focused its R&D activities on development of steel Yankees and steel cylinders for energy-efficient paper and board production.

Today, ANDRITZ is the record holder for large steel Yankees (up to 26 ft. diameter) and has installed drying cylinders made of steel in production lines worldwide.

## NEW HEADBOX GENERATION

The first *PrimeFlow* headbox was sold in 2009 and, to date, more than 40 additional units have been started up and are operating successfully.

## NEW HYBRID FORMER

In 2012, ANDRITZ launched a new hybrid former concept.

The *PrimeForm* HB is a state-of-the-art hybrid former, designed for an operating speed of up to 1,200 m/min.

## UNIQUE BELT CALENDER

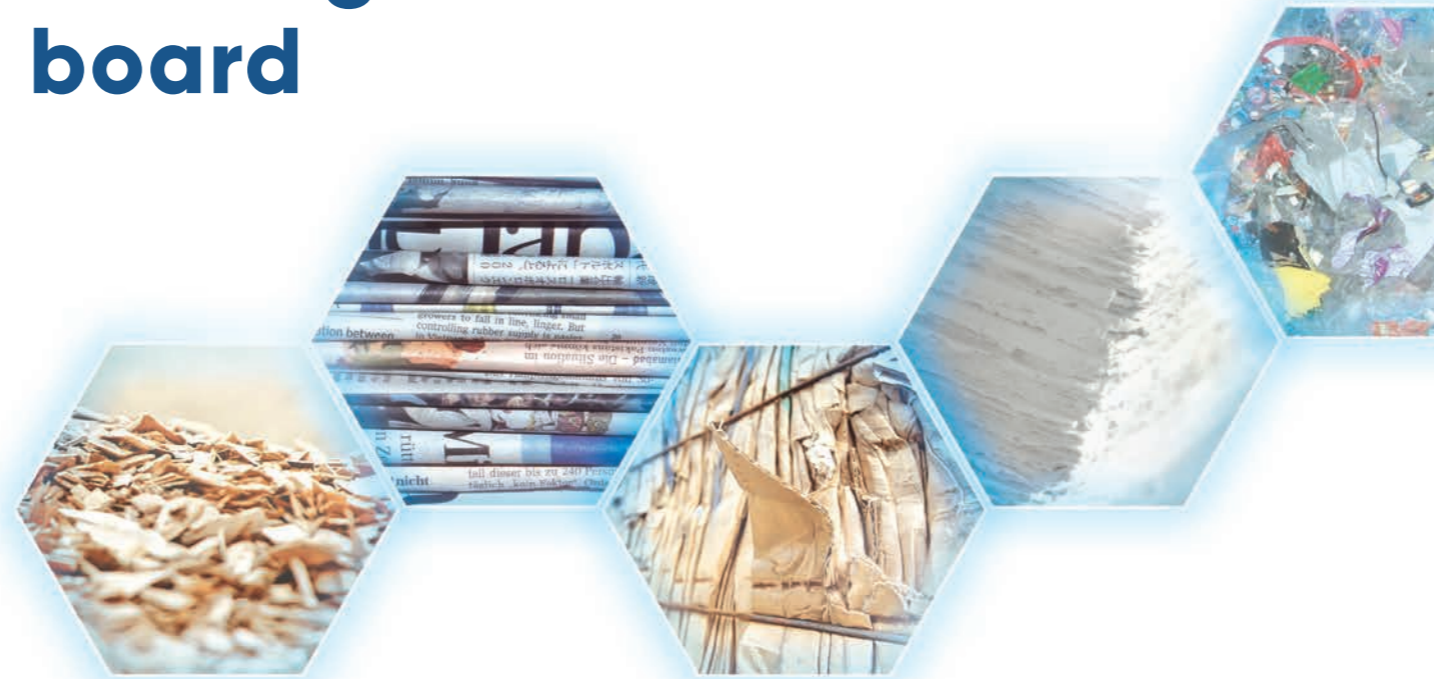
In 2014, the *PrimeCal* Y belt calender was introduced. This calender enhances surface gloss without loss of volume and is used for grades that require high bending stiffness.

## UPGRADE FOR CURTAIN COATERS

In 2015, ANDRITZ launched a nozzle for curtain coaters. It allows precise sectional volumetric correction of flows to ensure even coating across the entire web surface. Another new development makes it possible to apply barrier layers in the inboard mode without defects at the edges.

# Superior fiber processing for all paper and board grades

ANDRITZ knows how to meet the challenge of enhancing fiber quality with economical use of resources and offers complete mechanical pulping and fiber preparation systems comprising highly efficient equipment in every process step.



**LATEST INNOVATION**  
See the PrimeScreen X in action!

## GET THE BEST SYSTEM FOR YOUR VIRGIN OR RECYCLED FIBER LINE

Full-line capabilities in processes and equipment

Innovative design in best product quality – for highest efficiency and reliability to increase pulp quality

Efficient components with low energy consumption result in lower operating costs

Systems and units with highest availability, as well as shortest maintenance and downtimes

Lowest possible impacts on the environment – high reject consistencies are utilized to save on drying and disposal costs



### MECHANICAL PULPING SYSTEMS

ANDRITZ P-RC APMP technology for superior chemi-mechanical hardwood-based pulps

ANDRITZ ATMP (Advanced Thermo Mechanical Pulping) technology for enhanced fiber development of soft-wood pulps at reduced energy consumption

Semi-chemical pulping lines and special processes for annual fiber processing



### RECYCLED FIBER SYSTEMS

Full range of recycled fiber technologies for the production of excellent stock for various paper grades

Modern deinking lines meeting the most stringent requirements for the final stock quality (brightness increase, reduction of stickies and dirt specks)

State-of-the-art systems processing low-quality waste paper to produce high-quality packaging grades



### STOCK PREPARATION AND PMA SYSTEMS

Integrated stock preparation and approach flow systems for the production of all paper and board grades

Key equipment for every process step – from bale pulping through screening, cleaning, refining, thickening, deflaking, and fiber recovery

Innovative machine concepts for highest efficiency and availability at low energy consumption and minimum impact on the environment



### SLUDGE AND REJECT TREATMENT SYSTEMS

Extensive system competence for sludge and reject treatment process technology

Key unit equipment from fiber recovery, shredding, separation, fractionation, and thickening to drying and pelleting

Waste-to-value processes, converting rejects and mill waste into renewable energy and valuable by-products – thus helping to improve a mill's profitability

## EXAMPLE OF *PrimeLine* COMPONENTS / OVERVIEW OF AREAS OF APPLICATION

		Cartonboard	Graphical paper	Containerboard	Special papers
1) Headbox	<i>PrimeFlow AT</i>	●	●	●	●
2) Forming	<i>PrimeForm SW</i>	●	●	●	●
	<i>PrimeForm TW</i>			●	
	<i>PrimeForm HB</i>	●	●	●	●
3) Pressing	<i>PrimePress X</i>	●	●	●	●
	<i>PrimePress X Twin</i>	●	●	●	
	<i>PrimePress Tri X</i>		●	●	●
4) Drying	<i>PrimeDry ST</i>	●	●	●	●
	<i>PrimeDry DT</i>	●	●	●	●
	<i>PrimeDry MG (steel Yankee)</i>	●			●
	<i>PrimeDry AirFlow</i>	●	●	●	●
	<i>PrimeDry Steel cylinders</i>	●	●	●	●
5) Tail Threading	<i>PrimeFeeder</i>	●	●	●	●
6) Air systems	<i>PrimeRun Evo</i>		●	●	●
	<i>PrimeRun Mono</i>	●	●	●	●
	<i>PrimeRun Duo</i>	●	●	●	●
	<i>PrimeRun Poly</i>	●	●	●	●
	<i>PrimeRun Jet</i>	●	●	●	●
	<i>PrimeRun JetVent</i>	●	●	●	●
7) Creping	<i>PrimeUnit MC</i>				●
8) Sizing / Pre-coating	<i>PrimeFilm</i>	●	●	●	●
	<i>PrimeSizer</i>	●		●	●
	<i>PrimeFilmSizer</i>	●		●	
9) Calendering	<i>PrimeCal Soft</i>	●	●	●	●
	<i>PrimeCal Hard</i>	●	●	●	●
	<i>PrimeCal ProSoft</i>		●		
	<i>PrimeCal X</i>		●		●
10) Coating	<i>PrimeCoat Roll</i>	●	●	●	●
	<i>PrimeCoat Jet</i>	●	●	●	●
	<i>PrimeCoat Curtain</i>	●	●	●	●
11) Reeling	<i>PrimeReel Hybrid</i>	●	●	●	●
	<i>PrimeReel Premium Hybrid</i>	●	●	●	●
	<i>PrimeReel Premium Centerwind</i>	●	●	●	●

# Components for resource efficiency and high quality

Our core *PrimeLine* components are designed to work in two ways: stand-alone as part of an upgrade to existing machinery, or integrated together to create a state-of-the-art new machine.

## 1 HEADBOX

ANDRITZ state-of-the-art headboxes feature highly efficient turbulence generation for optimum formation over a wide range of flows and consistencies. The fluid dynamics are optimized in all headbox sections – tapered header, step diffusor turbulence generator, nozzle with lamellas, and slice area – to ensure a uniform and stable jet. This produces a homogeneous distribution of all raw materials within the final sheet. The compact design minimizes slice deflection even at high pressures.

In combination with *PrimeProFiler F* dilution profiling system, the most uniform basis weight profiles are achieved.

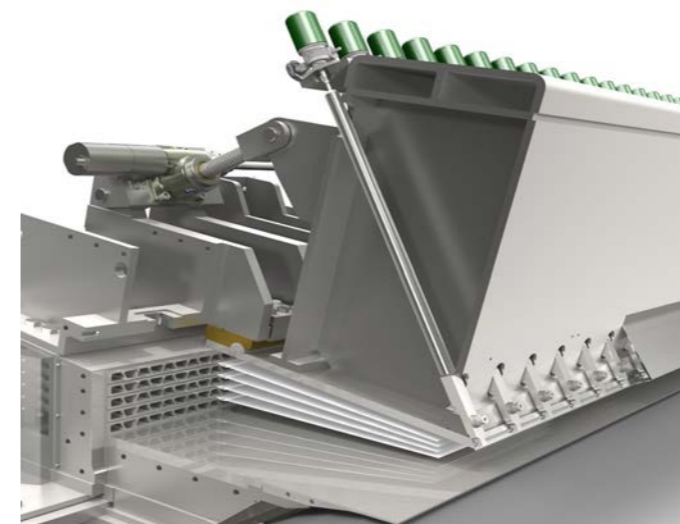
The papermaker's requirements for operating safety and easy access for cleaning have been taken into account. Electro-polished surfaces ensure excellent cleanliness and high availability.

## *PrimeFlow AT*

The new ANDRITZ *PrimeFlow AT* (accelerating tube) headbox reflects to successful combination of ANDRITZ and Paperchine's history and experience in papermaking. The patented accelerating tube headbox with unique nested trapezoid outlets features a rugged design structure, sheets in the nozzle for turbulence control, and capacity for high resolution dilution profiling.

This provides excellent jet quality, fiber dispersion and fiber orientation control over a wide grade and speed range. This results in excellent 2 sigma results over a wide operating range. The headbox also includes flexible lamella and is available with or without the indirect consistency profiling injection.

The *PrimeFlow AT* headbox is available for new machines, conversions, and rebuilds, for all kinds of paper and board machines.



### *PrimeFlow AT* HEADBOX IN BRIEF

#### Best fundamentals

The unique, patented, accelerating trapezoid tube provides superior flow uniformity

#### No compromises

Indirect dilution system at the tube bank – available with highest resolution on the market

#### Truly robust

Clean by design – lack of stilling chamber and uncleanable geometries; 100% stainless steel, no more plastic in headbox

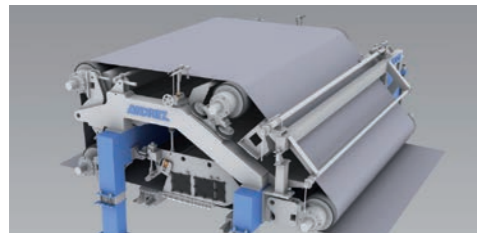
## 2 FORMING SECTION

Paper properties are strongly influenced by the spatial distribution of raw materials in the sheet. The optimized design of all *PrimeForm* products, especially when working in combination with *PrimeFlow* headboxes, delivers excellent paper quality and uniformity.

### *PrimeForm* HB hybrid former

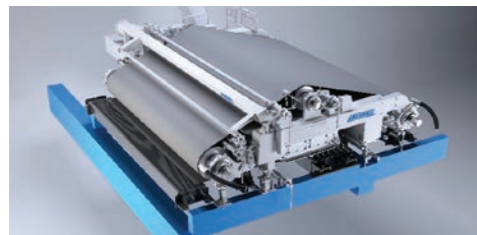
Paper properties are strongly influenced by the spatial distribution of raw materials in the sheet. The optimized design of all *PrimeForm* products, especially when working in combination with *PrimeFlow* headboxes, delivers excellent paper quality and uniformity.

The 4-roll *PrimeForm* HB is our standard offering, with full operational flexibility and optimized handling.



*PrimeForm* HB with 4 rolls

Our 3-roll version is ideal for tight rebuild situations since it has minimal height.



*PrimeForm* HB with 3 rolls

### *PrimeForm* SW former

The *PrimeForm* SW family of headboxes for fourdriniers offers a range of solutions tailored to the requirements of the paper or board grade. Designs are available to accommodate a broad range of machine speeds and widths for single and multiple fourdrinier sections. The design of the *PrimeForm* SW is compact, simplifying its installation in rebuild situations. The result is the production of high quality paper.



*PrimeForm* SW former

### *PrimeForm* TW gap former

The *PrimeForm* TW gap former performs superbly at high speeds with minimal two-sidedness and the highest dewatering performance. Basis weights from 70 to 160 g/m<sup>2</sup> are accommodated. Gentle dewatering in the forming roll area ensures high retention. The increased fines content is beneficial for strength development in the final sheet. Forming shoes on both the top and bottom generate optimized dewatering within a wide operating window.

### *PrimeForm* TW shoe gap former

The *PrimeForm* TW shoe gap former is the latest offering in the *PrimeForm* family. It's patented design combines the best characteristics of both single wire and gap forming: excellent strength and formation at high capacity, up to 250 g/m<sup>2</sup>. The low installation and operating costs increase coupled with wide operational flexibility make it the preferred choice for many projects.

## 3 PRESS SECTION

The *PrimePress* product portfolio includes press section configurations to optimize production and sheet quality for all paper and board grades and for both new construction and rebuilds. Roll presses and *PrimePress* X shoe nips are configured as stand-alone presses or in clusters with no open-draws which minimize sheet breaks and lost time. The inclusion of Xerium into the ANDRITZ Group integrates the best available technologies in press design, roll covers, felts, shoe press and transfer belts for the best possible press project outcome.

### *PrimePress* X shoe press

The *PrimePress* X is the ideal shoe press for increasing production with reduced drying energy. Nip loads up to 2,000 kN/m and shoe lengths from 120 to 400 mm are engineered for each application to maximize press dryness and sheet properties. The *PrimePress* X counter roll can be a conventional roll or a *PrimeRoll* HV Smart anti-deflection roll making all machine speeds and widths possible.



*PrimePress* X Twin shoe press



*PrimeDry* drying section

### *PrimePress* X Twin shoe press

This press configuration pairs two *PrimePress* X shoe presses to deliver the maximum pressing capacity for paper and board grades while minimizing the number of spares needed for reliable operation.

### *PrimePress* Tri X press

The *PrimePress* Tri X uses four rolls in a cluster press to form three nips, incorporating a *PrimePress* X shoe press in the third nip. This proven configuration is excellent for transferring the sheet through the press section with no open draw, broke handling, and least lost time following a sheet break.

### *PrimeSteam* VIB steam profiling systems

ANDRITZ VIB Systems offer steam profiling solutions that encompass the entire machine. The *PrimeSteam* VIB product family of profilers includes solutions for the forming and press sections, as well as for precision steam finishing at the dry end of the machine.

## 4 DRYING SECTION

The *PrimeDry* drying sections, covered by a *PrimeDry* Hood, are available in several different configurations. They can be equipped with additional *PrimeRun* components, *PrimeDry* Steel cylinders, film and size presses, coaters, and other auxiliaries.

### *PrimeDry* ST single-tier dryer section

The *PrimeDry* ST is a single-tier design that can be arranged without open draw to ensure maximum runability. The advantages of the *PrimeDry* ST can be used not only in the beginning of the drying process, but also throughout the entire drying section.

### *PrimeDry* DT double-tier dryer section

The *PrimeDry* DT is a double-tier design to obtain the

highest water evaporation rates. Depending on the machine speed targets, the runability is ensured by optimized configuration of the fabric guide rolls supported by the ANDRITZ *PrimeRun* stabilizing systems.

### *PrimeSpray* VIB spray systems

From fine paper to paperboard, from moisture profile control to enhanced surface applications, each ANDRITZ VIB spray system ensures the highest level of performance. The innovative dual-phase nozzle, utilizing air-atomization technology to deliver a full cone spray pattern, delivers one of the smallest droplet sizes available.

### *PrimeDry* MG hood

*PrimeDry* MG (machine glazed) hoods for board and MG papers can be arranged on the upper or lower sides of the MG cylinder depending on requirements. The hoods uniformly distribute drying air at the proper impingement velocity across the sheet to obtain high drying rates while maintaining an even moisture profile. The constant distance between the nozzle and the sheet enables optimum heat transfer. Drying temperatures up to 400° C and impingement velocities up to 130 m/s are achieved.

### *PrimeDry* AirFlow

The impingement hood is part of the *PrimeDry* AirFlow family. It can be arranged on both the upper and lower cylinder rows to boost the water evaporation rate. In unfelted dryers, the CD stretch profile will be improved (e.g. sack paper). The impingement velocity is adjusted by fan speed so that drying can be tuned to the paper qualities desired. The risk of over drying the edges can be avoided with separate edge zones. Drying temperatures up to 300° C and impingement velocities up to 120 m/s are achieved.

**THE ONE  
AND ONLY**

ANDRITZ is the only supplier worldwide being able to deliver steel Yankees with diameters up to 26 ft.



**PrimeDry Steel cylinders**

The thermal conductivity of the steel alloy in a steel cylinder is similar to that of the cast iron, but the steel has superior strength. This means that the cylinder shell thickness can be optimized to give less resistance to the heat flux. As a result, the *PrimeDry* Steel cylinder performs up to 10% better than the same sized cast iron cylinder at the same operating pressure – enabling a papermaker to either increase production or lower energy consumption. In addition the web is dried uniformly without bad edges.

In practice, steel cylinders can be run with a higher operating pressure than comparable cast iron cylinders. This is beneficial in rebuilds and upgrades, since it is possible to increase production without extending the dryer section. New machines therefore will have a shorter dryer section and still achieve a desired production level. Given the elasticity of steel is a high benefit against a cast iron material – no explosion due to overpressure or material fault possible.

**PrimeDry MG Steel Yankee**

This high performance drying cylinder is made entirely of steel, resulting in greater safety and better machine performance than a cast Yankee. The performance of an ANDRITZ *PrimeDry* MG Steel Yankee exceeds the performance of a cast iron Yankee of the same size. Steel Yankees have an evaporation rate that is 10-15% higher than that of cast iron models, which results in 8-10% better machine performance.



*PrimeDry* Steel cylinders with paper widths up to 9,800 mm and diameters up to 1,830 mm



The giant steel Yankees are delivered in two halves and assembled on the customer's site.

**SETTING WORLD RECORDS - AGAIN**

There seem to be no limits regarding Yankee sizes for production. It is transport that is the restriction: narrow streets, tunnels, weight regulations, etc. ANDRITZ accepted the challenge with the world's largest steel Yankee and the logistics strategy paid off:

With a diameter of over 7.315 m and a weight of 197 t, the *PrimeDry* MG Yankee produced for the Zellstoff Pöls PM3 in Austria is the largest welded, high-precision steel Yankee in the world. To be able to deliver the Yankee through the narrow roads and tunnels near the mill, the Yankee was manufactured in two halves. At the customer, the two halves were placed one on top of the other with millimeter precision, and ANDRITZ specialists welded the two halves together. After welding, the assembled steel Yankee was lifted into the machine hall with a 1,200 t crane in November 2018. The finishing work such as grinding and metalizing was performed once the Yankee was in its working position in the paper machine. The sophisticated logistic concept and the valuable experience gained from the Zellstoff Pöls PM2 Yankee in March 2013 made it possible to successfully deliver the high-precision MG steel cylinder of the PM3.



## 5 TAIL THREADING

The ANDRITZ technology for efficient, safe and stable tail threading for all areas of the paper machine, from the wet section to the pope reel. *PrimeFeeder* threading systems meet all criteria regarding safety, efficiency and stand for highest quality standards.

### **PrimeFeeder ropeless tail threading**

The *PrimeFeeder* system is a rope-less tail threading system, which significantly reduces machine down-time and threading time when compared to conventional feeding systems. *PrimeFeeder* installations work with different tail cutting and transfer systems, as well as blowing devices to ensure entirely rope-less tail threading from wet section to the pope reel. All operations are remotely controlled to keep operators a safe distance from the potentially hazardous areas of the machine.



PrimeFeeder ST JetBelt - vacuum conveyor

*PrimeFeeder* Jetbelt - vacuum conveyors are equipped with the latest drum motor technology and patented vacuum generation. Vacuum chambers in the unit are highly efficient and individually adjustable for proper and safe transfer of the tail. Jetbelt - vacuum conveyors can be used in all sections of the paper machine, for all basis weights and all speeds, they are extremely robust and easy to clean.

ANDRITZ provides special tail threading technology for single-tier or double tier dryer sections.

*PrimeFeeder* DG (Dryer Group) BlowDoctor systems uses the highest quality materials in advanced carbon composites and in aerospace aluminum alloy to guarantee highest resistance values with low weight to



PrimeFeeder DG BlowDoctor system

preserve the doctor blade. The systems are equipped with patented high effective nozzle design, which is very economical in air consumption.

## 6 AIR SYSTEMS

Air systems like the *PrimeRun* web stabilizers enable a trouble-free paper run with reduced draws, even at highest machine speeds. There are different modules and configurations to meet individual requirements. The *PrimeRun* web stabilization system is ideally suited for fast single-tier and double-tier paper and board machines. It can easily be retrofitted to existing machines as part of a rebuild project.

### **PrimeRun web stabilizers**

In a single-tier drying section where initially the paper web has low wet strength, various forces act upon the web. High machine speeds intensify these forces, especially in the web release zone in the first drying cylinder groups. This can lead to an unstable web run, creases, and edge problems requiring running the machine at a higher draw, increasing the opportunity for sheet breaks. The new generation of web stabilization – *PrimeRun* Evo – controls and improves the runability of the web while saving energy in single-tier drying sections. It does this by gradually reducing the vacuum from the opening nip. Not only does this improve web control, it also reduces energy consumption.



PrimeRun Evo web stabilizer box

### **PrimeVac vacuum roll**

The *PrimeVac* vacuum roll is a core component in the web stabilizing system that fixes, via vacuum, the web on the fabric. This results in stable guiding of the web through the single-tier drying section. The roll has a drilled roll shell. Doctor blades on the bottom box are employed to seal the area between the roll and the box across the machine.

## 7 CREPING

### **PrimeUnit MC extensible unit**

Being installed in the dryer section at a dry content around 60–65% this unit is the most important tool to produce high stretch sack paper. The moist web passes through the nip between a moving rubber blanket and a rotating dryer cylinder in the *PrimeUnit* MC. The rubber blanket is pressure-loaded by a „nip bar“ so that the gap in the nip is less than the thickness of the



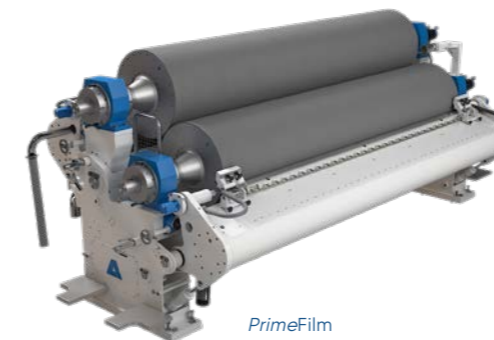
ANDRITZ  
PrimeUnit MC  
extensible unit

rubber blanket. The rubber then acts like a fluid passing through a venture, accelerating so that the flow volume remains constant. The paper web faces a significant creping resulting in a very high stretch effect in the final paper giving the paper highest Tensile Energy Absorption which is the crucial parameter for special sack paper qualities.

## 8 SIZING/PRE-COATING

### **PrimeFilm, PrimeSizer presses and PrimeFilm Sizer**

ANDRITZ film and size presses apply sizing solution and coating color simultaneously to both surfaces of a paper or board web.



*PrimeFilm* is a film press for simultaneous double-sided sizing, pigmenting and coating of paper and board. Different coat weights can be applied to each side. The coating color or sizing solution is metered onto the roll surfaces by means of metering rods and transferred to the paper or board web in the roll nip. The film press can also be used for single-sided applications. *PrimeFilm* has a compact design, enabling easy integration into the existing paper or board machines. In addition, it is easily accessible to allow rapid changes in the coating weight.

*PrimeSizer* is a device for simultaneous application of sizing solution directly to both sides of paper and board. The sizing solution is applied as a pond before the roll nip and transferred to the paper or board web.

*PrimeFilm* Sizer combines both application methods into one unit for the widest possible range of coat weights.

## 9 CALENDERING

Calenders improve the smoothness and gloss of the sheet and other properties of paper and board. While achieving these desired properties, the challenge has always been to minimize loss of bulk so as not to adversely affect the stiffness or opacity of the product. *PrimeCal* calenders provide full control in the nip to tailor a finish that provides the desired quality and printability. These calenders are well suited for final calendering of newsprint, fine papers, and different types of board. If the calender is equipped with single element-controlled *PrimeRoll* MHV technology, papermakers are able to create state-of-the-art CD (cross direction) caliper profiles.

### **Multi Master control system**

The Multi Master control system is a scalable, modularized control and monitoring system for process applications in automation.

### **PrimeCal Soft calender**

The *PrimeCal* Soft calender provides soft calendering for a wide range of applications. It is based on proven Mat-On-Line technology and uses rolls with soft, elastic covers that form a nip replicating the surface of the tempered roll with a hard surface – thus improving the paper properties. The finish in general enhances the performance characteristics and printability of the sheet.



PrimeCal Soft calender

### **PrimeCal Hard calender**

The *PrimeCal* Hard calender is well suited for precalendering and final calendering of all paper and board grades. It creates a consistent CD caliper profile, allows bulk control, and produces an excellent surface finish.

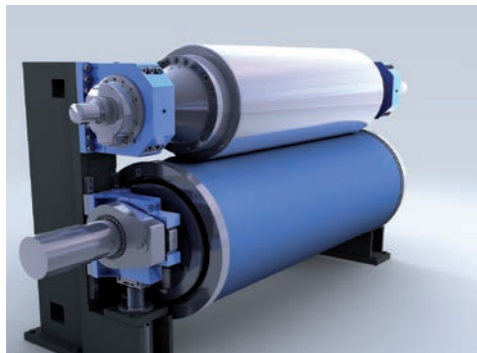
### **PrimeCal ProSoft calender**

The *PrimeCal* ProSoft calender, a multi-nip calender, is ideal when exceptional paper qualities are required. Since it employs a higher number individually driven rolls the highest gloss and smoothness qualities can be achieved. Depending on the required paper qualities, the *PrimeCal* ProSoft can be operated with a variety of nips and soft covers within a wide range of operating conditions, such as line loads and temperatures, suitable for online and offline installations.

### PrimeCal X shoe calender

At the normal speeds of paper machines today and at a nip load up to 15 MPa, the *PrimeCal X* shoe calender is the best product for increasing production with longer dwell times in the nip and still maintaining volume. This volume conservation can lower the cost of raw materials (fibers).

The nip pressure in a *PrimeCal X* shoe calender can be fully controlled, resulting in even surfaces of excellent quality and printability. The *PrimeCal X* is highly suitable for the final calendaring of thermo-sensitive papers, coated testliner and board, and for calendaring specialty papers. Homogenous print images (without mottling) are produced by surface temperatures of up to 280° C. Nip lengths from 50 to 170 mm are available to meet specific customer requirements.



PrimeCal X shoe calender

### 10 COATING

*PrimeCoat* family consists of three types of coating units, which are designed for coating of paper and board over a wide range of application conditions. Depending on coat weight, operating speeds and paper or board quality requirements, ANDRITZ supplies *PrimeCoat Roll*, *PrimeCoat Jet* or *PrimeCoat Curtain* coaters.

#### PrimeCoat Roll and PrimeCoat Jet

*PrimeCoat Roll* uses an applicator roll to apply the coating color to the paper web, and *PrimeCoat Jet* makes use of a jet nozzle for this function. In both cases metering is performed with a blade or metering rod. During the metering process, the web is supported by a polyurethane-covered backing roll that is motor driven. This way, variations in web tension have no



PrimeCoat Jet coater

direct influence on the final coated product. For different coating applications such as pre-coating, middle, or final top coating ANDRITZ supplies the appropriate metering components, such as bent/stiff blade or rod. Upgrading to ANDRITZ coating technology gives the customer the opportunity to quickly and efficiently achieve specific quality targets for coating of specialty paper grades.

### PrimeCoat Curtain

Curtain coating is an alternative to conventional coating technologies. The advantages of curtain coating are excellent coverage, saving of energy through higher solid content, saving of coating color and less web breaks through a noncontact process. The multilayer curtain coater enables the application of several coating layers simultaneously using only one coating station. The number of coating and drying stations are reduced, resulting in a compact and efficient design. This results in remarkable cost savings. Due to its compact design, the *PrimeCoat Curtain* is ideal for integration into existing machines. The curtain coater applicator can be operated with a slot die for single layer coating or with a slide die for multilayer coating. The coating can be applied in overboard and inboard modes.

### 11 REELING

The *PrimeReel* family is a modular platform designed to maintain uniform paper quality from the first to last wrap on the reel. Three configurations are available.



PrimeReel reeling systems

#### PrimeReel reel

The *PrimeReel* is the basic reel with nip load compensation. It consists of a linear primary arm and conventional pivoting secondary arm.

#### PrimeReel Advanced reel

The *PrimeReel Advanced* consists of a linear primary arm and linear secondary arm for paper products which need sensitive handling during reeling.

#### PrimeReel Centerwind reel

The *PrimeReel Centerwind* incorporates centerwind-assisted drive for linear primary and secondary arms. It enables winding of larger diameter parent rolls without any deterioration in reeling quality.

# Research and development – Calender pilot plant and laboratory



The calender pilot plant at the ANDRITZ Paper Technology Center in Krefeld, Germany

### THE CALENDER PILOT PLANT

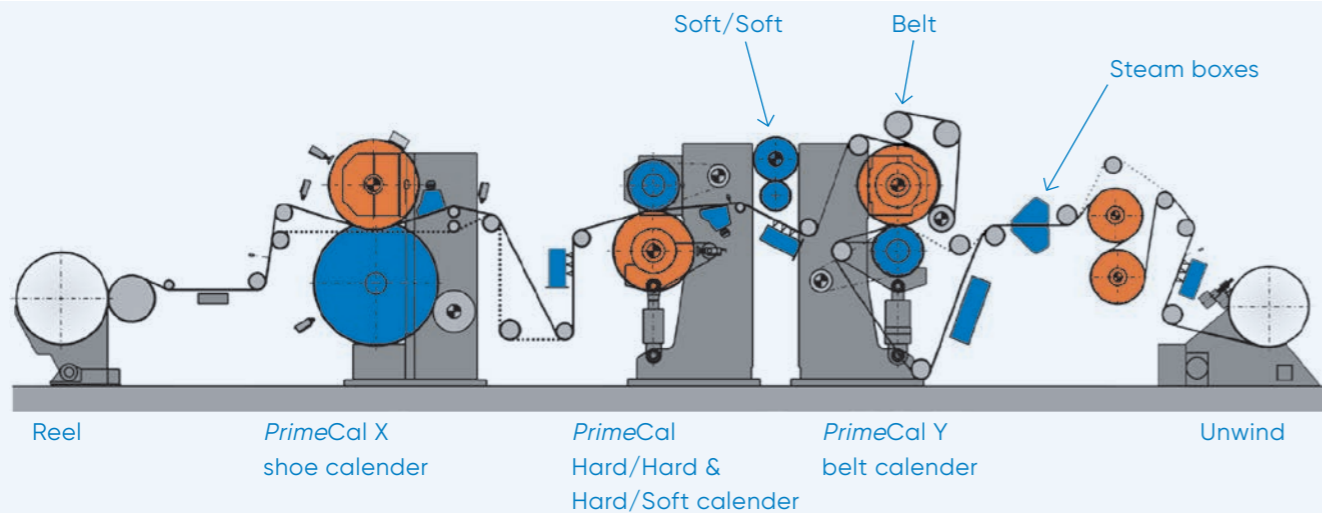
Our customers have the opportunity to rise to new levels of paperfinishing with the support they get from us. The calender pilot plant at the ANDRITZ Paper Technology Center in Krefeld, Germany is available for customer trials. The machinery is supported by ANDRITZ technological experts and laboratory specialists in a flexible state-of-the-art pilot facility.

The ability to run trials and immediately see the results is tremendously important when creating or testing new concepts. Our pilot facility aids in this by demonstrating how new ideas and technical inventions will create benefits for you. You can run trials with your own products under actual operating conditions. Using our computational modeling tools, operating conditions at production speeds and scale can be duplicated.

We support your trials with all common calendaring technologies. Every trial is thoroughly planned by our experts so that you can tune and change the technical parameters during a test.

The pilot plant is available for running trials of printing/writing papers, special papers, cartonboard, and packaging grades with its 2×2 or 8+5 rolls and a maximum speed of 1,500 m/min at a surface temperature up to 220° C.

You can decide between our *PrimeCal Hard/Soft* calender, *PrimeCal X* shoe calender, and *PrimeCal Y* belt calender, which can be configured in many ways to take papermaking to a new level.



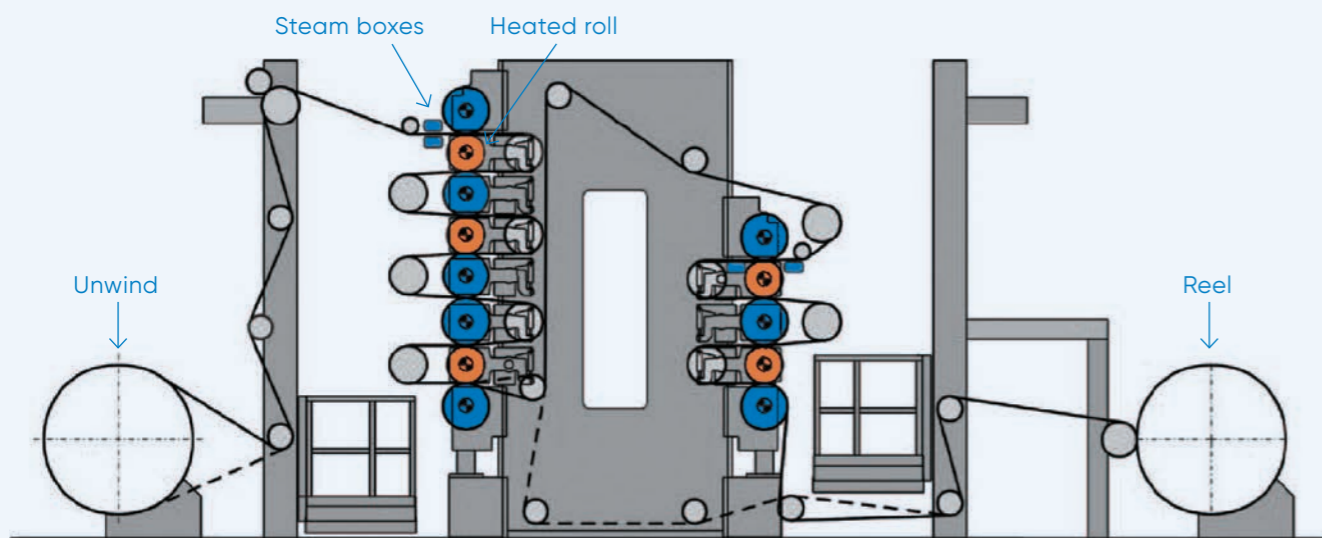
Machine layout: Pilot line with different calenders.

### PrimeCal Hard/Soft, X, and Y

Rolls	2 x 2
Roll configuration	Hard / Soft Hard / Hard Soft / Soft
Covers	up to 92 ShD
Line load	10–370 kN/mm
Speed	1,400 m/min
Roll surface temperature	up to 220° C
Steam boxes	4

### PrimeCal ProSoft

Rolls	8 + 5
MultiNip	max. 4 + 6
Web width	800 mm
Line load	10–400 kN/mm
Speed	1,500 m/min
Roll surface temperature	up to 180° C
Core diameter	76–150 mm
Reel diameter	max. 1,450 mm
Steam boxes	4



Machine layout: PrimeCal ProSoft calender

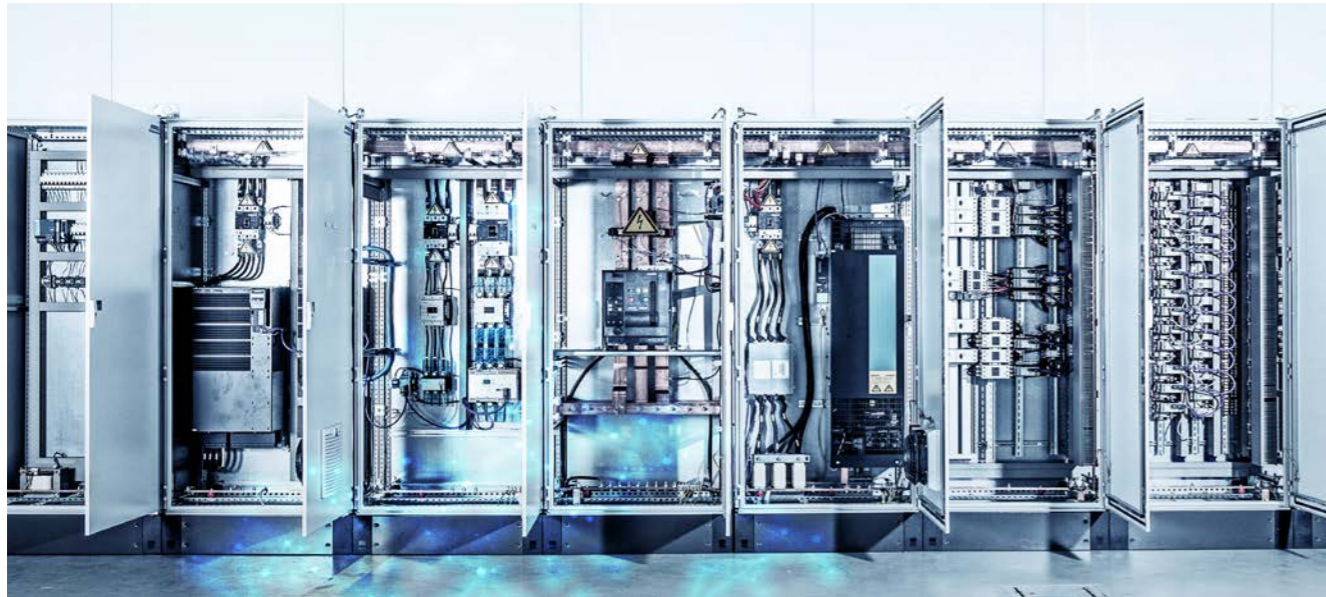
### THE LABORATORY

To maximize your result and support you with the best know-how available, you will have access to the laboratory and testing facility. In this special compound, our qualified employees and experts will measure different parameters to define how the test run on our machines has changed the outcome of the product. Of course, you will also receive samples, data, and further advice relating to the trials from our experts.

### LABORATORY TESTING CAPABILITIES

- Caliper and bulk
- Moisture
- Gloss (Lehman, Gardner)
- Smoothness (Bekk)
- Porosity (Bendtsen, Gurley)
- Optical properties
- Roughness (PPS, Bendtsen, Sheffield)
- Bending stiffness
- Blackening index
- Imaging analysis
- Ash content





# Automation solutions: Process-specific or complete turnkey installations

Control, automation, and optimization are handled with a multi-disciplinary and holistic approach. All solutions are fully integrated to enhance operations, maintenance, information delivery and quality assurance.

Modern mills require a very high degree of automation to monitor and control the flows, valve technology, machinery, drives, on-machine quality, speeds, throughput, and other important aspects of paper and board production. Systems with the flexibility to monitor and control everything from stock preparation to paper finishing are very important.

With over 110 different ANDRITZ Automation locations all around the world, the portfolio comprises both project concepts and execution throughout operations, starting with pre-feasibility studies and front-end engineering of controls, electrical and power systems engineering followed by estimating, scope development, and value engineering. This also includes project management, erection work, start-up and operator training and continues with maintenance and engineering work for expansion and improvement projects.

The turnkey approach is interdisciplinary, closely linked with process design and using well-maintained templates and consistent design data for plant engineering and framework supply. With plant control systems, simulation and advanced control tools, automation experts help paper plants to become operationally ready within a short start-up period through comprehensive process know-how and pre-tested components. The close cooperation between automation experts and other business areas consolidates the concentrated process knowledge that creates significant advantages and customer-focused solutions.

### INCREASE IN OVERALL PROFITABILITY

The drive for innovation continually improves both processes and plants in order to raise the efficiency, sustainability and profitability of the plant and its processes while reducing costs and downtime.



# Foresee digitally with Metris

### ANDRITZ DIGITAL SOLUTIONS

As a technology leader with extensive and long-term experience in supplying industrial measurement, control, and optimization solutions for various industries, ANDRITZ is combining process and equipment expertise with the latest enhancements in the digital era. The result of this powerful combination is Metris: a portfolio of ANDRITZ Digital Solutions.

### METRIS OPP

One of the flagship solutions of Metris is to optimize industrial processes with Metris OPP - Optimization of Process Performance. Metris OPP has been developed over the past decade and is installed today in over 50 mills - mainly pulp mills - around the world. It combines powerful analytical and data mining software with the knowledge of the world's top process experts to deliver a smart service initiative for customers.

### A CONSTANTLY GROWING PORTFOLIO

The depth and effectiveness of the Metris portfolio continues to improve thanks to ongoing R&D, collaboration with key customers and institutions, and venture activities. Portfolio options all rely on the three strategic focus areas of the Metris brand: Industrial IoT technologies, Smart Service concepts, and Venture activities. The main technological advancements integrated into individual Metris products are derived from big data analytics, smart sensor technologies, and augmented reality solutions. The Metris UX Platform

providing full support throughout the entire lifecycle of a plant is the most recent of our IoT developments. With Metris, customers foresee digitally due to the continuously improved portfolio and its performance - and to ANDRITZ providing tailored and fully integrated digital solutions from a single source.

### INDUSTRIAL IOT

### Benefits

- IIoT solutions across business segments
- Combined know-how from ten years' experience with Metris OPP
- Using the latest smart sensor technologies
- Big data analysis with tried-and-tested models for deviation analysis
- Providing information locally with augmented reality
- Extensive solution and process engineering knowledge
- Cybersecurity solution to safeguard data on the network



# PrimeService for paper and board: Improve your machine performance

ANDRITZ supplies spare parts and engineered wear products and provides customer-specific maintenance and upgrade services for your paper mill – from stock preparation to the reel, including automation solutions, and pumps.

Our service specialists are skilled and experienced at raising the production efficiency of a machine, process step, or production line. Their knowledge helps protect and extend the life of your equipment and lower your overall operating costs.

Our 60 service locations for the pulp & paper industry offer you full service support. This support is provided to you – technically, mechanically, and personally – regardless of who originally manufactured your equipment.

The huge variety of ANDRITZ upgrade products provides performance improvements, energy and cost savings as well as return on investment (ROI) within shortest time. We work closely with you to monitor, maintain, repair, and upgrade your assets.

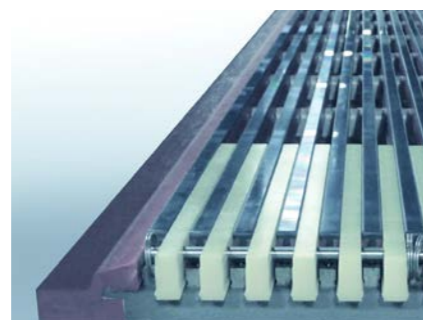


## PRODUCT HIGHLIGHTS



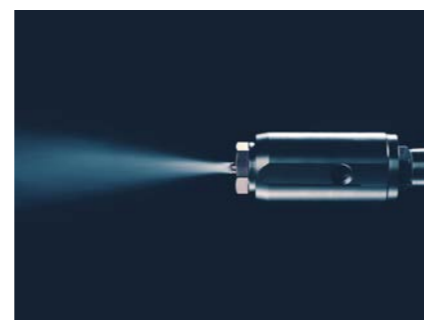
### HEADBOX OVERHAUL

With our proven headbox overhaul program we inspect, recondition, and, if necessary, rebuild your headbox to extend the lifetime of this component, restore machine performance, and improve sheet quality. This is a cost-effective alternative to replacing the entire headbox.



### CERAMICS

We deliver customized ANDRITZ PrimeCeramics solutions as well as blades and engineered drainage systems with advanced design suited for all paper machine types and paper grades. Our goal is to optimize sheet formation and reduce drive load, while providing the best ROI of the selected types of ceramics.



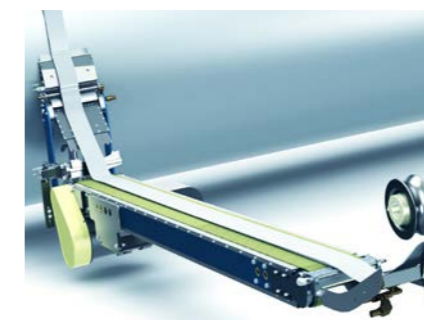
### VIB PROFILING SYSTEMS

Improving the sheet's cross-directional moisture profile has been demonstrated as one of the most effective and economical means of saving fiber and energy and improving overall quality levels, as evidenced in our VIB product families.



### ROLL SERVICE

We are experts in servicing conventional and deflection-controlled rolls of all designs and from any manufacturer. Our comprehensive roll services include roll and shoe press audits and repairs as well as new covers and coatings to enhance performance and increase lifetime.



### THREADING SYSTEMS

We provide custom solutions for both new equipment and rebuilds to existing systems to suit all of your tail threading needs. This includes components, system design, in-depth threading audits, technical service, and start-up support with the aim of minimizing down time and enhancing safe operations.



### NOZZLES

High-pressure nozzles, trim squirt nozzles, edge trimming units, and pump systems contribute to high-precision machine operations and excellent product quality. Best application and maintenance support is backed up by our comprehensive knowledge of paper machine design and operation.

# Mill success stories: Customers all over the world rely on ANDRITZ

"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  
CEO  
Zellstoff Pöls AG

"Their technology adapted perfectly to our requirements. The machine had to fit into an existing space that was rather low and tight. The gap former was therefore tailor-made on the basis of these requirements."

Modesto Cardella  
Managing Director, Member of the Board  
Cartiere Modesto Cardella, Italy

"By including ANDRITZ's technologically advanced solutions, we have increased speed, increased production, increased quality, and increased machine efficiency."

Andrei Fomichev  
General Director  
Naberezhnye Chelny, Russia

"We appreciate ANDRITZ's flexibility and advanced technical solutions. Communications are good and response time is remarkable."

Ümit Özkan  
Mill Manager  
Kartonsan, Turkey

"We chose ANDRITZ because we had a successful association with the company, and they were capable of taking the whole project from dismantling in Finland to erection and optimizing in Russia, and everything in between."

Roman Steinberg  
Director for Investments  
SFT Group, Russia

"The project went very well. We met all of our major milestones. A lot of praise and credit goes to the ANDRITZ team."

Ulf Löfgren  
Mill Manager  
Iggesund Paperboard Workington, UK



## PrimeLine MG

The machine is Europe's largest new kraft paper machine and is equipped with the world's largest steel Yankee.

# Zellstoff Pöls PM3, Austria: 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.

The customized concept of the *PrimeLineMG* paper machine, which is characterized by a specially designed wire section and a closed draw press, among other elements, is unique. It allows flexible production of paper qualities with maximum strength, high printability, and low basis weight.

### 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 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 *PrimePress* 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 *PrimeDry* 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 *PrimeDry* MG steel Yankee at Pöls the world's largest.



### 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



**LATEST INNOVATION**  
Get to know the Vertical Screw Thickener!

### YANKEE HOOD

The *PrimeDry* 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 *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.

"The PM3 is designed for high-quality papers with basis weights lower than 28 g/m<sup>2</sup>. A perfect addition to the PM2!"

Werner Hartmann  
Managing Director Starkraft  
Business Unit of 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/m <sup>2</sup>

**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

### 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/m <sup>2</sup>

# 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 PrimeLine 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

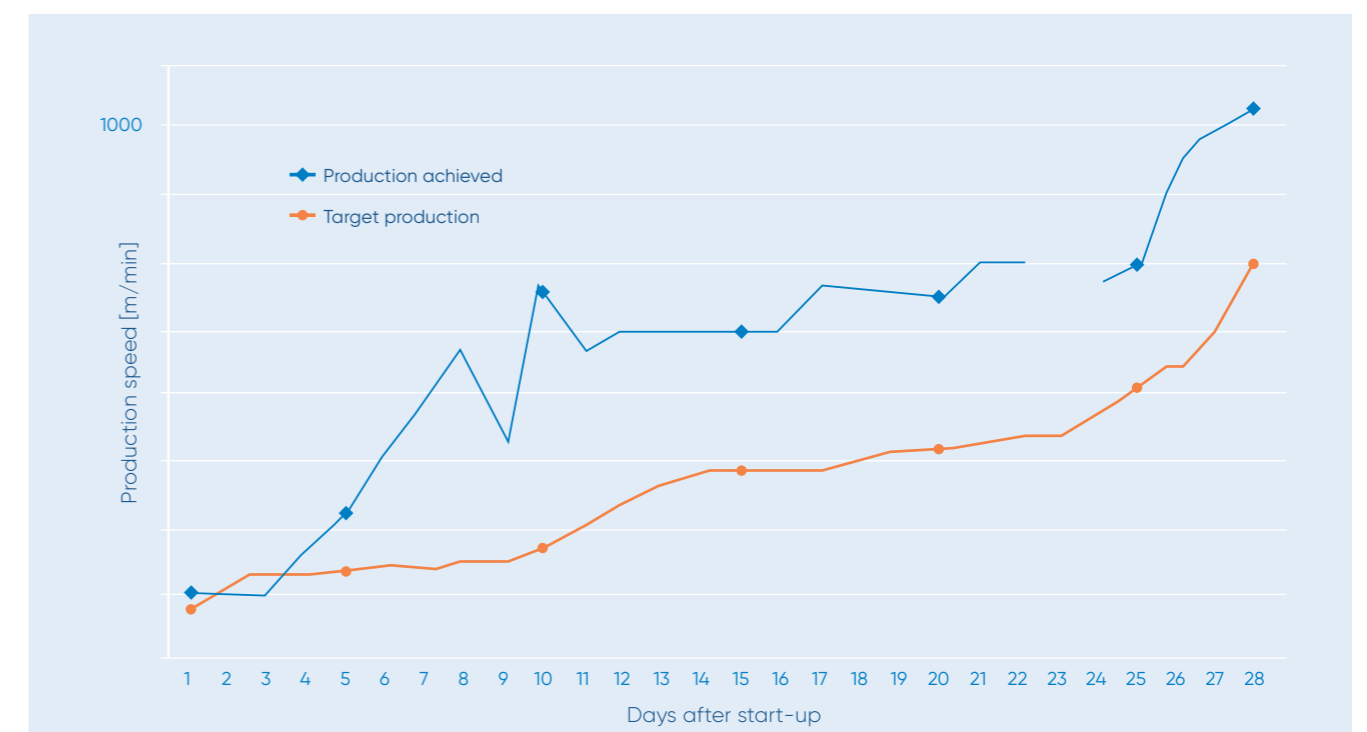
In terms of production and final product quality, PM3 exceeded all expectations right away in the first four weeks after start-up.

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<sup>2</sup> were produced successfully.

**"Collaboration with the team from ANDRITZ was excellent, and this was also reflected in the outstanding PM3 start-up curve."**

Siegfried Gruber  
Head of Project Engineering  
Zellstoff Pöls AG

Start-up curve: first four weeks ramp-up







Laakirchen  
PM10, Austria

Transformation from graphical paper  
to containerboard

# Laakirchen Papier PM10, Austria: A rebuild for premium production

October 28, 2017 saw production of the first roll of corrugated base paper at Heinzl Group's Laakirchen Papier AG in Austria. ANDRITZ took on the challenge of the remarkable conversion of the mill's PM 10 from graphic paper to packaging paper, including a rebuild of the groundwood mill into a complete OCC line. The rebuilt machine is now performing well over the planned start-up curve, ready to capture a fast-growing market.

At Laakirchen, the prime concern of the parent company, the Heinzl Group, was to make the mill fit for the future. The history of this upgrade began in April 2013, after the Heinzl Group took over the location that was producing graphic paper grades on two paper machines. Mark Lunabba, CEO of Laakirchen Papier AG, remembers, "One of the first ideas our chairman, Alfred Heinzl, had was that we would have to improve our results and avoid being affected by the falling demand for printing grades."

Various possibilities were discussed, but it soon became clear that PM 10 would be ideal for the production of corrugated base paper. Lunabba says, "Market volume was also needed that would match the capacity of the machine. And as a result, corrugated base paper became our specialty."

## GOOD FOUNDATIONS

The final decision on the rebuild of PM 10 was made in August 2016. It was decided that the machine would now be converted to make 450,000 t/a of high-grade fluting and testliner with a grammage of 70-140 g/m<sup>2</sup> from 500,000 tons of recycled fibers (RCF). A budget of around 100 MEUR was estimated. The other machine, PM 11, was to continue producing graphic paper grades in a highly efficient production process.

"We didn't want to run any quality risks," says Lunabba. "So it was important for us to go with tested and proven solutions. ANDRITZ has a great deal of experience with RCF lines and had also proved that they know how to successfully convert machines. However, ANDRITZ was new to corrugated base paper so we also had to work together closely and help each other in determining solutions."

Another reason for placing the order in Graz, according to Lunabba, was the successful experience the Heinzl Group had with ANDRITZ and sister company Zellstoff Pöls, during installation of its PM 2 specialty paper machine, which went into operation at the mill in 2013.

Michael Pichler, Senior Vice President, Paper and Board at ANDRITZ, also emphasizes that it "was a project of high strategic significance, and Heinzl was the ideal partner for us. There is a great deal of mutual trust."

The rebuild covered the stock preparation system, the wet end and dry end of the paper machine, the film press as well as automation. In addition, ANDRITZ supplied the complete basic process engineering.



The PrimeFilm film press applies starch simultaneously to both sides of the paper web in order to achieve the desired strength values at the high speed.



ModuScreens TD tailing screens are part of coarse screening. Efficient washing of fibers is done with a FibreWash Drum – one important part of the detaching system.



The fractionation section comprises a combination of existing equipment and a ModuScreen A with a matched screen basket/rotor concept.

### CRITICAL PHASE

The rebuild phase was influenced by two special factors: the extreme time pressure – a corridor of only 12 months was defined between the decision to make the investment and start-up of the machine rebuild – and the customer’s stipulation to integrate as much of the existing equipment as possible at the same time as allowing PM 11 to continue running alongside the rebuild work.

“The actual time scheduled for the rebuild work itself was ten weeks. We were then four days late in getting stock onto the wire. In view of the intensity of the rebuild, that was a very brief delay,” says Mark Lunabba.

Johann Stadlmayr, head of technical planning, adds, “Completing this project within that time set new standards. After all, the shutdown phase was estimated at a point where we did not want as much rebuild work. Then more and more items were added in the course of the project, although the deadline remained the same because there was already a demand for the product on the market.”

### NEW STANDARDS

Up to 600 people were working on the site over a period of four to five weeks, and there were actually more than 800 there during the peak phase. There was very little space, the second machine was running, and as if that wasn’t enough, building work, installation, and cabling had to be carried out simultaneously as well. “The overall logistics were an absolute masterpiece,” says Stadlmayr.

“And the overall result is very positive, ANDRITZ really proved that they were able to handle this project,” says Lunabba.

Stadlmayr adds, “Of course, there were some obstacles, but we were able to overcome them relatively quickly and professionally. Everyone involved went through a learning process in this project; however, drive never let up. The achievements of the ANDRITZ Project Manager, Franz Fischer, who did a very good job, were also very positive. He was extremely approachable, 24 hours a day, seven days a week, and was always able to suggest a swift solution.” Fischer describes the start-up itself as an emotional roller coaster ride, “One day we would make good progress only to suffer a setback again the next day.” However, now, the rebuilt machine is performing well over the planned start-up curve.

### FAVORABLE FEEDBACK FROM THE MARKET

Jan Reibert, PM 10 Production Manager, confirms, “The paper machine is now operating with 100% recycled fibers. That meant a fundamental rethinking process for all those involved. The film press was also new ground for us, but we had it well under control from the word ‘go’.” Two months later, the challenges involved in every start-up were resolved, and the paper machine is running very smoothly without any web breaks, according to all those involved. The highest daily gross production was recorded so far on March 17 at 1,360 tons saleable production. The speed was in the region of 1,200 m/min, and the operators have already set a target of 1,400 m/min. Since the beginning of the year, the plant has seen very stable production – considerably above the planned start-up curve.

“The market situation for our new product is currently very good. That’s why we also did not want to have any delays,” says Lunabba. The company expects the demand for corrugated base paper to increase by 5% per annum, so the timing is absolutely perfect. “We wanted to sign contracts at the end of 2017 for 2018,” he says, and refers to the positive feedback from the market, “The goods we sent to customers received top ratings. There was not a single complaint.”

### GRAND FINALE

After 17 years at Laakirchen, Mark Lunabba is retiring. The PM 10 project was thus the grand finale of his career. “I am leaving on a high note and with confidence in the top-performance organization we have here.”

Johann Stadlmayr is also looking to the future with optimism, “This was one of the most challenging, intensive, and exciting projects for Laakirchen and one that involved major changes. It was a great achievement and we can all be proud of where we are today. This is a key project for the future!”



**FibreSolve FSR  
PULPER**

The pulping system with detaching includes a 130 m<sup>3</sup> FibreSolve FSR pulper – the largest LC pulper ANDRITZ ever installed in Europe

NEW PRESS SECTION / after the rebuild

# Naberezhnye Chelny K28, Russia: A game-changer

Naberezhnye Chelny Board & Paper Mill has more than 30 years' experience with tissue and packaging grades. For its largest investment so far, the rebuild of a board machine, ANDRITZ was selected as technology partner.

In the heartland of Russia, 800 km east of Moscow, is the Republic of Tatarstan. Located alongside the Kama River is the small yet thriving city of Naberezhnye Chelny, home to Naberezhnye Chelny Board & Paper Mill (KBK).

## SELECTING THE RIGHT PARTNER

KBK has two machines – one for the production of tissue and one for the production of packaging grades. In 2012, KBK decided to make an investment to rebuild and upgrade the wet end and press section of its K-28 board machine.

"We wanted to increase our quality, machine efficiency, and production throughput," says KBK's former General Director, Vladimir Bestolkov. "Since this was going to be the largest investment in this mill's 33-year history, we took the decision regarding the equipment supplier very seriously." During the tender period, the KBK management team assessed the various industry players, locally and abroad, to determine who could embrace this challenge and deliver the best payback. "We opted for ANDRITZ based on the company's experience, reputation, and knowledge," Bestolkov says.

The benefits and results have been nothing short of remarkable. "I am proud of the work our employees did, working in very close cooperation with ANDRITZ," says Bestolkov proudly. "We had saleable paper from the second reel on."

**"Since this was going to be the largest single investment in this mill's 33-year history, we took the decision regarding the equipment supplier very seriously."**

Vladimir Bestolkov  
former General Director  
KBK



The mill site of KBK at Naberezhnye Chelny

The rebuilt machine was started up on August 28, 2014. Post upgrade, the average machine speed increased 27% (470 to 600 m/min) and capacity was boosted 21% to 190,000 t/a on this two-ply machine with a working width of 4.25 m. The "usual" pressures: time and money. Making the right investment choices is not an easy task. KBK's rebuild project had to succeed in order for the company to be well positioned for future market growth. With a growing demand for packaging and tissue, the company is in the right niches. "Our products are sold throughout Russia and demand continues to grow, with a current market share for board-based products of 7.5% and hygiene products of 17%," says Andrey Fomichev, General Director.



It is with sadness that we report that Vladimir Bestolkov (right side), General Director, has died since this story was first published. Director Bestolkov made significant contributions to the Russian pulp and paper industry and had a passion for papermaking.

In terms of raw materials, KBK is moving in the green direction. Furnish is OCC recycled fiber for hygiene, fluting and liner products; delivered from various regions of Russia, with 10% coming from Tatarstan. "After signing the contract in late 2012, the pressure was on all of us to meet the projected deadlines and keep within budget," notes Fomichev.

#### STRATEGIC AND DETAILED PLANNING

A machine rebuild of any magnitude requires detailed planning to reduce the shutdown time and close cooperation onsite in order to succeed. Since ANDRITZ was supplying the main technical components as well as supervision of the erection, commissioning, and start-up, detailed handoffs had to be planned.

"For our part, we planned everything in detail to ensure that all the components and specialized tooling would be on-site for the shutdown beginning at the end of June 2014," says Klemens Unger, ANDRITZ Project Manager. "Everything had to be in place so that the erection team could carry out its assignments without delay."

#### SCOPE OF SUPPLY

The ANDRITZ delivery included the machine approach system, pumps, two-ply wire section with new headboxes and dilution control, and a press section with shoe press in the second nip. In addition, according to Unger, "We also supplied the *PrimeFeeder* threading system from the press section to the drying section, *PrimeRun* web stabilizers for the machine's single-tier dryer section, the machine drives, the quality control system, the distributed control system, the machine drives, and the motor control center for our scope of supply."

The old wire section of K-28 had seven vacuum formers, but now has two wire tables. "We opted for the *PrimeFlow* SW headboxes with dilution control since they are technologically state-of-the-art," says Mikhail



**"The time period from shutdown to start-up after the rebuild was a quick 45 days – truly a game-changer in the Russian paper industry."**

Andrei Fomichev  
General Director  
KBK

Nokhrin, Chief Engineer. "The lamella design inside creates excellent formation, fiber distribution, and paper profiles. The *PrimePress* X significantly improves dewatering and saves us energy. Because of this, we were able to increase production without rebuilding our drying section."

#### UNFORESEEN CHALLENGES

KBK, with its professional leadership, was meticulous and focused on garnering the best results from the project. "We certainly faced challenges," says Unger from ANDRITZ. "In any rebuild, you need to be flexible to adapt your technical solutions if required. For example, a detailed study of the existing foundation concluded that it would not be sufficient to carry the static loads created by machine clothing replacement. Together with specialists from a Russian construction company, we developed a solution to reinforce the existing foundation and adapt the construction of the machinery beams to avoid the expense and time delays for making a completely new foundation." Geographic distances, and the complexity of preparing documents for Russian customs clearance were also challenging at times. "We all entered this project with a team spirit and a common goal," says Unger. "The teams united seamlessly on all levels to meet the deadlines and KBK's expectations."



From a seven-ply suction former to a two-ply machine with press section.



Wet end view of the rebuilt K-28 paper machine



(l-r) Sergey Gavrilov, Board Production Manager; Ivo Valtchev, ANDRITZ Sales Manager; Klemens Unger, ANDRITZ Project Manager; Andrei Fomichev, General Director; Sergey Poteryaev, Deputy General Director for Production; Mikhail Nokhrin, Chief Engineer; Vladimir Bestolov, former General Director; and Georg-Michael Sautter, ANDRITZ Senior Sales Director.

#### A CONCLUSION AND A NEW BEGINNING

K-28 was restarted in its new configuration and saleable paper came quickly. So did the final acceptance. "By including ANDRITZ's technologically advanced solutions, we have increased speed, increased production, increased quality, and increased machine efficiency," says Fomichev. "Productivity has improved by a large measure due to the sheet formation, web stabilization, and the closed draws between wire and press, and within the press section. Sheet breaks are a rare event now."

March 17, 2015 became a noteworthy day when KBK management signed the Final Acceptance Certificate (FAC) with ANDRITZ. "Seven months from the start-up of the new and improved K-28 and we have final acceptance," says Georg-Michael Sautter, Senior Sales Director for ANDRITZ. "This is a record in itself, being the fastest achieved for such a complex rebuild project in Russia." Although the project has been concluded, it is not intended to be the end. "I have mixed emotions, Sautter says. "The business negotiations were tough, but we have also established strong bonds and solid friendships. The cooperation has been truly remarkable." With the second stage of KBK's modernization plans now concluded, a third stage is anticipated during 2016 to 2020. "Our goal is to optimize the machine to achieve 800 m/min with stable quality parameters, which will increase production to 250,000 t/a," says Fomichev. "ANDRITZ delivered what they promised. Any time we faced a technical hurdle, we found a working solution. This is a valuable asset that ANDRITZ people possess. We will strongly consider partnering with them in the future."

#### COLLECTIVELY COMMITTED AND RESPONSIBLE

KBK is one of the few employee-owned enterprises in Russia. "We are committed to the 1,717 employees here," Fomichev explains. "Our founder, General Director Titov, had a vision 20 years ago regarding the ownership structure. He had housing built for employees and their families near the mill." KBK has also built two kinder-gartens and a school, and sponsors sports activities, charity and social events, and other activities.

In September 2014, the mill was visited by the President of Tatarstan, Rustam Minnikhanov, together with various government ministers to witness the ANDRITZ upgraded K-28 in action producing linerboard. President Minnikhanov was impressed by what he saw at the enterprise. "Today, we have seen the fruits of modernization," he said. "You are a good example for other companies."



LEFT TO RIGHT

Ulf Löfgren, Mill Manager, Iggesund Workington Mill; Barbara Freyler, ANDRITZ; Roland Scheiflinger, ANDRITZ; and Gary Pickering, Head of Workington's Project Department.

# Igesund Workington BM2, United Kingdom: It must be good – It must be brilliant!

Igesund Paperboard's mill in Workington, UK restarted its board machine after ANDRITZ rebuilt the press section – increasing capacity 10% and reducing energy consumption by almost 10%.

Europe's folding boxboard market is in transition with new machines starting up. "The supply/demand situation has changed since we decided to rebuild the press section of BM2," admits Ulf Löfgren, Mill Manager at Workington. "But the investment is still quite valid. We wanted increased volume and consistent quality with reduced energy consumption. Our strategy is to focus on the premium segment and we have a very good product with good quality."

Sweden's Holmen Group, parent company of Iggesund Paperboard, has been investing progressively in Workington's future for years. On BM2 itself, the mill previously had upgraded the wire section. At another time, ANDRITZ installed a new hood for the Yankee cylinder. Iggesund also invested in a new biofuel boiler (an ANDRITZ unit) in 2011, switching from natural gas to biomass energy. Even after these investments, the work continues. As Löfgren says, "We are in a good place, but you must always improve. It must be good. It must be brilliant!"

As part of the pre-project analysis, ANDRITZ sent a team of experts to assess different options on the machine. ANDRITZ's Roland Scheiflinger, Vice President Paper and Board, believes this analysis convinced the Iggesund team that the press section needed to be upgraded before anything else, because there would be little point in increasing capacity elsewhere if the press section remained a bottleneck.

And removing bottlenecks to increase production is a genuine priority at Workington. The infrastructure at the mill is set up for about 250,000 t/a of packaging board production. Production of cartonboard reached its peak in 2008, when Workington was operating two board machines. The mill's on-site production of mechanical pulp for their board's inner layers is sized to support this level of production. The future target of increasing BM2's capacity will bring the mill's pulp and board production back into balance.



**"We have gained speed on all grades, including the higher grammages where we did not think we would."**

Gary Pickering  
Head of Project Department  
Iggesund Paperboard, Workington mill

"It is extremely important to get tonnes onto the market," Löfgren says. "That is of great value to us." Indeed, Workington could have gained additional capacity by upgrading other parts of BM2 before the press section. But maintaining, and even improving, product quality was also key. Löfgren explains it in this way: "The press section is a critical part of any machine, impacting efficiency, economics, and quality. Not only was the press section on BM2 a bottleneck, upgrading it also offered the best potential for a boost in product quality all the way down the machine."

As the UK's only producer of paperboard using virgin fiber, Workington does not compete with other UK mills, but rather with producers of solid bleached board and folding boxboard around the world. "In the last decade, our strategy has been to move up the quality chain and focus on premium segments," Löfgren says. "In these premium segments, product quality needs to be the same on Monday morning as it is on Saturday night." Workington produces the Incada brand of packaging board, which is available only in the GC1 and GC2 qualities. Incada was re-specified and re-launched in 2013, and is now among the most recognized folding boxboard brands in Europe, along with Iggesund's Invercote brand. Incada is sold for high-quality packaging of cosmetics, pharmaceuticals, confectionery, and premium or luxury items.



The ANDRITZ PrimePress X shoe press is a very low-maintenance design which gives the Iggesund Workington mill the required bulk and dryness for its premium board products.



**"The project went very well. We met all of our major milestones. A lot of praise and credit goes to the ANDRITZ team."**

Ulf Löfgren  
Mill Manager  
Iggesund Paperboard, Workington mill

In planning the project, ANDRITZ and Iggesund Workington spent time discussing the best configuration for the press section: two shoe presses vs. the combination of a long-nip press (LNP) with a shoe press.

According to Scheiflinger, "two shoe presses would give more uniform dewatering and better bulk, plus higher throughput. On the other hand, the combination of an LNP with a shoe press would provide both stiffness and dryness. In either case, these would be followed by a smoothing press."

Gary Pickering, Head of Workington's Project Department and Project Manager for this rebuild, says, "We had been looking at press section options for two years. At first, we were only considering the pick-up roll, but the scope expanded and every time it did, there was a justification for it. In the end, we replaced everything and opted for the combination LNP and shoe press."

Scheiflinger believes that the work his team did at the front-end showed Workington people that ANDRITZ really understood the machine. Löfgren concurs. "Our decision to award the order to ANDRITZ was based on the work they did in the pre-decision phase," he says.

"They worked closely with us and showed us that they wanted the project. We felt we would be able to work with them in a good atmosphere of cooperation and partnership. We have a lot of confidence, trust, and belief in ANDRITZ. We were in the same boat together. It has been a successful project."

Scheiflinger sums it up: "We tried to be a very pro-active partner, not just a supplier. We didn't just want to deliver hardware, but we wanted to improve the performance of the machine."

ANDRITZ installed a complete new press section including a long-nip jumbo press with large diameter rolls, an energy-efficient PrimePress X shoe press in the second nip, and a smoothing press. The delivery also included ANDRITZ's state-of-the-art PrimeFeeder vacuum system for ropeless tail threading from the press section to the dryer section. Erection services, commissioning, start-up, and optimization were all part of the package.

"In addition to the press hardware," says Barbara Freyler, ANDRITZ Director of Order Execution, "we supplied new drives for the wire and press section, the motor control center, multi-motor integration with



ANDRITZ installed a new press section on Iggesund's BM2, including a long-nip jumbo press with large diameter rolls, an energy-efficient PrimePress X shoe press in the second nip, and a smoothing press. The delivery also included ANDRITZ's state-of-the-art PrimeFeeder vacuum system for ropeless tail threading from the press section to dryer section.

BM2's existing drive system, an ANDRITZ FibreSolve broke repulper under the machine, all the power and data cabling, field instrumentation, and electrification." According to Scheiflinger, there are several technical advantages to the installation at Workington. "First, the shoe press is a very low-maintenance design and gives the mill flexibility in choosing the belt supplier. Second, the hole design in the Uhle boxes was a big plus and the simplified vacuum system for the wire and press section allows the existing vacuum pumps to be controlled individually. Finally, the automation includes our state-of-the-art PrimeControl system which features ANDRITZ-written software on PCS7 hardware from Siemens." The plans looked good on paper. How did everything go in reality?

Löfgren says, "The project went very well. We met all of our major milestones. A lot of praise and credit goes to the ANDRITZ team – they were excellent. The machine achieved the target quality and produced saleable board quickly after start-up." Pickering adds: "There was a sheet on the reel in well under a half day. It was a big achievement for all of us because it was a tough timescale." According to Freyler, "Our teams worked as one and never lost sight of the main goal. We learned from each other and about ourselves."

Many of the results of the upgrade are already evident, while others will only be seen in the future. "Our customers want lighter weights," Löfgren says, "so we are pushing to get the desired bulk with lower grammage. We believe we now have the foundation to do this." Scheiflinger adds, "Board stiffness has been increased at all grammages, while the bulk remains similar. That was the goal." "We have gained speed on all grades, including the higher grammages where we did not think we would," Pickering says. BM2 was press limited to about 450 m/min. It is now mechanically designed to run up to 800 m/min, although speeding up the machine largely depends on future upgrades.

Commenting on the new vacuum system, Pickering says, "We were worried that we might not have enough vacuum capacity. With the new design, we can run with one spare pump. It is working even better than we expected."

The last word goes to Mill Manager Löfgren: "ANDRITZ has done a great job. If anything, they have strengthened their position."

# SFT Kamenskaya PM7, Russia: A reincarnation in packaging

The SFT Group and ANDRITZ have completed a remarkable project together. They took on a major challenge of dismantling a graphic paper machine in Finland, transporting it, and reincarnating it as a packaging machine in Russia.



The SFT Group produces 460,000 t/a of paper and board and 460 million m<sup>2</sup> of corrugated packaging. It is vertically integrated from recovered paper collection to converting.

As soon as you enter the gates of the SFT Group's Kamenskaya paper mill midway between Moscow and St. Petersburg, you come to the realization that this is no ordinary manufacturing site. This mill has been through a huge amount of change. The signs and relics around the mill speak of a very colorful past. The mill started in 1799 as a writing paper plant and has been bought and sold a number of times. Once it was lost as part of a gamble. It was even completely dismantled, moved, and re-erected in the Ural Mountains.

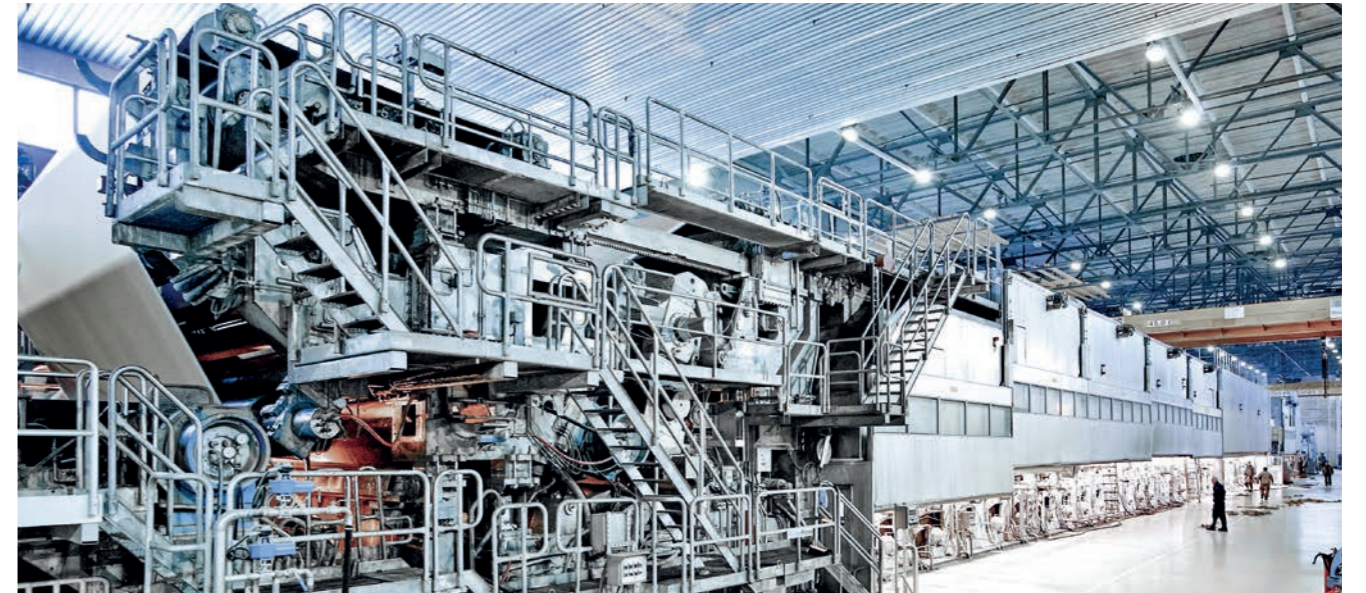
Stability arrived when the SFT Group bought the mill in 2003. The Group currently produces 460,000 t/a of paper and board, and 460 million m<sup>2</sup> of corrugated packaging. Stepan Khomyakov, CEO of the SFT Group, says: "Our Group is focused on the packaging business – vertically integrated with wastepaper collection, mills, and converting facilities. It is a challenging business, but a good business. Russia is becoming more and more a country of consumers, and more consumption means more packaging."

To meet this growing need, the SFT Group's products are used for packaging everything from food to televisions. Because the Russian recovered paper market is underdeveloped – with a collection rate of only 5% per household and a high ratio of virgin fibers used in containerboard production – the quality of the raw material is excellent.

#### STABILITY DOESN'T MEAN STANDING STILL

The SFT Group has high ambitions: to produce some 700,000 tonnes of paper and board and 800 million m<sup>2</sup> of corrugated packaging annually by 2018, which will make in number one in Russia.

Working towards this goal, Roman Steinberg, Director for Investments for the SFT Group, explains the latest project. "We needed more capacity, but a brand new machine was out of the question due to the capital required," he says. "So we kept a close eye on the secondhand market, and eventually a shuttered graphic paper machine in Finland came to our attention."



PM originally came from Finland, where it produced machine-glazed kraft paper. ANDRITZ integrated parts of the old machine, including sections that required refurbishing and upgrading, with its own paper machine technology to deliver a state-of-the-art packaging machine.

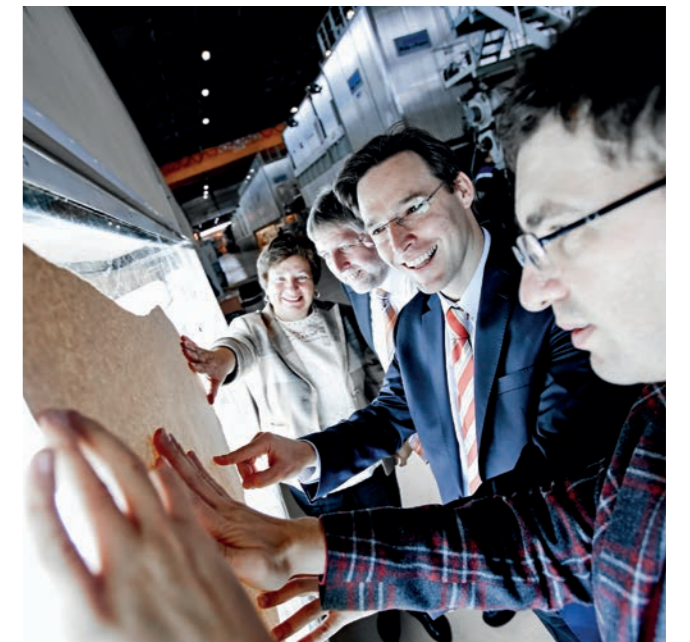
The machine came from UPM's Kymi mill, where it produced machine-glazed kraft paper. With a trim width of 4.6 m and speed of 1,050 m/min, the machine seemed to be the perfect choice for the SFT Group's expansion requirements. The decision was made to purchase what was to become PM7 at Kamenskaya.

ANDRITZ was chosen as the company that would be instrumental in handling the complex project. Says Steinberg, "We chose ANDRITZ because we had a successful association with the company, and they were capable of taking the whole project from dismantling in Finland to erection and optimizing in Russia, and everything in between."

#### "WE NEEDED A MASTER PLAN"

ANDRITZ received the order in June 2011 and soon afterwards dismantling of the machine began. But, this was no ordinary dismantling, according to Klemens Unger, Lead Project Manager for ANDRITZ. "Not only did the thousands of parts from this 1970's machine have to be painstakingly catalogued and marked for re-assembly," Unger explains, "but all the parts needed to be checked and overhauled quickly to keep the very tight time schedule."

Karl Eickhoff, the ANDRITZ key player in the project explains: "For a complex project like this, we developed an overall master plan document where we basically broke the machine down into functional sections, and then analyzed each part to make sure we could salvage as much as possible from the old machine. The goal was to save the SFT Group as much money and time as possible, while still getting the parts ready in time for installation."



Left to right: Raisa Zaikova, Kamenskaya Paper Mill; Karl Eickhoff and Klemens Unger, ANDRITZ; and Roman Steinberg, SFT Group; check the formation of the finished product.



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Left to right: Sergey Semyonov, Kamenskaya Paper Mill Technical Maintenance Manager; Mikhail Kozlov, Kamenskaya Paper Mill Production Manager; Roman Steinberg, SFT Group Director for Investments; Raisa Zaikova, Kamenskaya Paper Mill former Executive Director; Karl Eickhoff, ANDRITZ; and Klemens Unger, ANDRITZ, in front of PM7.

Overhaul of the old machine began in August 2011 in Finland. "In the case of this machine," says Eickhoff, "since it had been shut down for five years, there were quite a few parts that needed rework." The transportation of the machine to its new home in Russia took place in November and December of 2011. The logistics required 280 containers and 20 specially adapted trucks for the two-day journey. After the civil work, which included the dismantling of two old paper machines, installation of PM7 started in May 2012.

Turbo-boosting and future-proofing To help establish the Kamenskaya mill as a world class packaging producer, ANDRITZ added its own technology to turbo-boost the production line. The machine was built up to state-of-the-art by integrating current technology from ANDRITZ with refurbished and upgraded sections from the old machine. "It was not just a matter of putting old and new together," Eickhoff explains.

"The UPM machine contained equipment from Metso, Voith, Honeywell, and others," explains Unger. "It was our challenge to integrate parts from these various suppliers with our own ANDRITZ paper machine technology. But the result speaks for itself."

In the press section, a *PrimePress X* shoe press was installed to obtain maximum dryness and improve sheet properties. More improvement in drying comes with an extension of the original dryer section, adding new and refurbished dryers, and installing a *PrimeRun* web stabilization system. ANDRITZ also upgraded the winding diameter up to 2.7 m and automated the roll transportation and reel spool return. There was also some future-proofing incorporated into the wire section of the machine. Since the SFT Group's plan is to produce a two-ply liner, ANDRITZ lengthened the dewatering area of the wire to allow for the addition of a top layer forming unit in the future.

The end result, according to Eickhoff, is a state-of-the-art system. "Not only the packaging paper machine itself, but the entire line," he says. As part of the project, ANDRITZ delivered a new recycled fiber processing line with a capacity of 800 t/d of 20% mixed waste and 80% OCC. ANDRITZ also installed a new machine approach system, including three-stage headbox screening, a save-all disc filter, and undermachine pulpers. Commissioning of the machine began in March, and the first paper was on the reel June 11, 2013.



ANDRITZ also delivered a new recycled fiber processing line and machine approach system with a capacity of 800 t/d to bring high-quality stock to PM7's new headbox.

### "WE ARE ALREADY INFLUENCING THE RUSSIAN MARKET"

Raisa Zaikova, former Executive Director of the Kamenskaya Paper Mill, says: "This was a very big project for us, but it was one of the biggest of its kind for ANDRITZ as well. In terms of the timeline, we are completely delighted."

We were told by a Finnish consultant that this project would take a minimum of three years. Together with ANDRITZ, we completed it in 23 months. We are delighted with the quality, and so are our customers. We are not yet up to the design speed 1,050 m/min, but we know that ANDRITZ will help us achieve that in the near future."

"ANDRITZ Automation's control systems have contributed to our quality improvement," says Steinberg. "We can control the quality more easily. This is not only noticeable to our customers, but to our competitors as well. We are seeing signs that they want to follow us down this route, and already they are offering special deals. This project shows that the SFT Group is having a major influence on the market."

### WORKING TOGETHER – WE CREATE THE FUTURE

Before this project, the Kamenskaya mill was rarely visited by others from around the world, and English was mostly unrecognized. Steinberg explains, "With ANDRITZ involved, the many meetings about the project were a new arrangement for us. ANDRITZ was patient with us, sharing their knowledge. We reached a common understanding. I can't say that the team speaks English now, but they can communicate well with the assistance of Google Translator!"



ANDRITZ Automation integrated existing and new features into its DCS and QCS systems.

"This was not just an equipment supply deal," Unger remarks. "A true spirit of partnership was a common goal. Yes, it was full of challenges but both teams were committed and both shared a common vision." It seems the project can be summed up with the SFT Group's own mission statement: "Working together – we create the future."

**"We were told by a consultant that this project would take a minimum of three years. Together with ANDRITZ, we completed it in 23 months."**



Raisa Zaikova  
Former Executive Director  
Kamenskaya Paper Mill



## NEW CALENDER

In the calender section, a new hard-nip calender was installed. It achieved the agreed smoothness parameters soon after start-up.

# Kyiv Cardboard BM1, Ukraine: This is rare

Often, we have the privilege of reporting on new technological breakthroughs. But at the upgrade of the BM1 at PJSC Kyiv Cardboard and Paper Mill in Ukraine, that is not so much the focus. The new shoe press and calender from ANDRITZ have brought gains, true, but what was arguably most interesting in this case was...

"We didn't need guarantee runs!" So says Aleksandr Yakovina, Quality Director at the mill, where he started working on BM1 three decades ago. In this case, we are talking about a 37-year-old machine, one of four identical board lines built during the Soviet era - two in Russia, and two in Ukraine. With a working width of 4.2 m, BM1 produces white-top liner and white-lined chipboard (GD2 & GD3) in a basisweight range of 125-420 gsm, combining with the mill's BM2 to turn out up to 240,000 tonnes per year of packaging paper and board.

## PROBLEMS SOLVED

Yakovina explains that "We are trying to continue modernizing step by step to reflect market requirements, e.g. BM1 is starting to produce lots of products in low grammages (150-200 gsm) for flexographic printing. In this respect, the upgrade to the press section in early 2019 has improved all of the low grammages, as well as enabling us to make lighter-weight grades in the 150-180 gsm range."

What is perhaps most remarkable about his claim that guarantee runs were unnecessary is that this was not an easy project. According to Aleksandr Kravchenko, the mill's Chief Technical Officer, "It was a tough start-up." The mill planned a 21-day shut-down for the project (from last paper to first paper), with three of those days set aside for the start-up. As Yakovina explains, "there are problems to be solved in every startup" and in this case, that meant "we eliminated some threading issues in the press section and into the dryers."

Georg-Michael Sautter, Senior Director Sales, Paper & Board says, "What I remember most was that, during the installation, we had meetings ever morning and the team leader came to me calmly, gave me a notebook and pen and said 'Write that down [Sautter's recommendations] and I will communicate it to our

**"This is the first step in a whole modernization concept. The aim was to reduce energy consumption and we succeeded."**

Aleksandr Yakovina  
Quality Director  
PJSC Kyiv Cardboard and Paper Mill



The upgraded press section on BM1 has a new geometry and increased capacity, with a new ANDRITZ PrimePress X shoe press in the original second position. (left to right) Aleksandr Yakovina, Georg-Michael Sautter, Aleksandr Kravchenko, and Vitaly Solovyov

specialists.' Every morning, we solved some issues." Indeed, Yakovina confirms, "we solved all of the problems and started up on schedule" and the machine achieved the contracted values for dryness, bulk, and smoothness right away.

#### YOU GOTTA HAVE FAITH

Georg-Michael points out that "Normally it takes six or seven months to acceptance." In this case, the more than 30-year industry expert explains that, "It only took three." All of which brings us back to Yakovina saying there was no need for guarantee runs. He explains why: "We saw that all the contract values were being achieved in normal operation, so we didn't need to do a warranty test run. This is rare." Vitaly Solovyov, Chief of Cardboard Production at Kyiv, adds, "This depends on the supplier's experience." And the Kyiv team had seen plenty of evidence of ANDRITZ's experience.

Before going ahead with this upgrade, they visited one of the identical BMs (at Naberezhnye Chelny in Russia – twice), as well as Reno di Medici in Arnsberg, Germany and the Iggesund mill in Workington, UK.

#### IT'S COMPLICATED

That led to the green light for this several million Euro project, and while there may not have been any world firsts involved, that is not to say that there were no points of technological interest. Sautter notes that "the press section wasn't simple. Look at the space and the height. Plus, we used bigger rolls and new sheetfeeding technology; the project was a real challenge. The tough part is that you're going into an existing plant – you have to take account of all the parts that are already there. It's much harder than building it new."

This part of the upgrade involved ANDRITZ moving the existing 1982 press from the second to a newly-created third position, while installing a new PrimePress X shoe press in the original second position, between the two original presses. The special shoe design delivers gentle dewatering and preserves bulk, while reducing steam consumption and cleaning time.

Besides that, "the shoe press has some unique features," explains Sautter, which include "a patented solution that doesn't cause belt wear, so the belt doesn't need to be moved to prevent wear." But the key point of this upgrade was reduced energy consumption, and steam use in BM1's rebuilt press section is now down by -20%.



The upgraded calender section provides a consistent CD caliper profile, bulk control, and excellent surface finish.

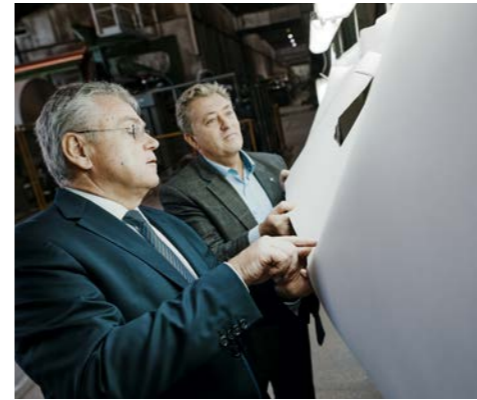


BM1 produces white-top liner and white-lined chipboard in a basis-weight range of 125-420 gsm.



**"Normally it takes six or seven months to acceptance. Here it only took three."**

GEORG-MICHAEL SAUTTER  
Senior Sales Director  
Paper & Board, ANDRITZ



(left to right) Georg-Michael Sautter and Aleksandr Yakovina checking the paper quality

This, Yakovina points out, was future-orientated, as "This is the first step in a whole modernization concept. The aim was to reduce energy consumption and we succeeded. Now, if we raise the capacity of the machine in the future, we will need to use less energy."

On that subject, the press section upgrade has increased the potential capacity of that part of the machine to 800 m/min, and the next bottleneck is the 7-stage mould cylinder former section, which is currently maxed out at 450 m/min. The short-term aim is to install an 8<sup>th</sup> vacuum former, so the machine will be able to run less mass per former, and therefore raise the running speed. This is expected in February 2020. The mill then plans to rebuild the whole wire section into a fourdrinier section in a later investment.

In contrast to all the planned and completed changes in the wet end, the Soviet-designed dryer section will not be re-designed. It uses 95 cast-steel cylinders arranged in eight groups, with 93 drying and two cooling. Although these have all already been running since the mill's start-up in 1982, there are no plans to replace these – as Sautter explains, "steel cylinders can last for over a century." However, the steam and condensate system will likely be upgraded at some stage in the future.

#### CALENDER DATE

In the calender section, ANDRITZ installed a new PrimeCal Hard calender to provide a consistent CD caliper profile, bulk control, and a smoother surface finish. Yakovina explains that the resulting consistent board geometry is key for flexographic printing. And the 200°C calender also had a target of delivering roughness in a range of 2.5-3 pps (Parker Print Surf), especially on low grammages.

**"All of the preparatory work and project realization was really good, with a high level quality of work and experienced people."**

VITALY SOLOVYOV  
Chief of Cardboard Production,  
PJSC Kyiv Cardboard and Paper Mill



#### STABLE QUALITY

Sautter says "There was nothing unusual in the calender, but we delivered it, installed it, it ran and it achieved its smoothness targets – it worked." Also part of the upgrade by ANDRITZ was an extension of the automation system on BM1. Although Sautter admits this is a normal part of any major upgrade, Yakovina adds that in this case, it "helped us to achieve stable quality".

#### HISTORY LESSONS

But besides the techno-industrial aspects of this project, both ANDRITZ and the Kyiv mill's team seem very focused on people. Yakovina says, "The most interesting thing for me was when ANDRITZ told us its history during the negotiations. I like very much that ANDRITZ honours its history. For example, if you go to different departments, ANDRITZ seems to keep hold of all of its knowledge and pass it on to new people from generation to generation." Which is key, as Yakovina continues, "An important factor is to have the appropriate technical personnel, to solve technical problems. I have worked on many modernizations and frankly, there is no company or project that doesn't have some sort of issue. The question is, how do they communicate and help us solve it? If problems arise, ANDRITZ doesn't leave us alone, they give us advice. Every time there is good communication. In the end, everyone was satisfied."

Solovyov adds, "All of the preparatory work and project realisation was good, with a high-level quality of work and experienced people. If there were any questions, they got solved very fast. It's not difficult when everyone is experienced."



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p: +43 508 052 1754

### GERMANY

ANDRITZ Küsters GmbH  
p: +49 2151 340

### ITALY

ANDRITZ Como S.r.L.  
p: +39 031 396332

ANDRITZ Novimpianti S.r.L.  
p: +39 0583 30219

### FINLAND

ANDRITZ OY  
p: +358 0 20 450 5555

### RUSSIA

LCC ANDRITZ  
p: +7 812 315 0863

### CHINA

ANDRITZ (CHINA) Ltd., Foshan  
p: +86 757 8250 2636

ANDRITZ (CHINA) Ltd., Beijing  
p: +86 10 8526 2720

### JAPAN

ANDRITZ K.K.  
p: +81 3 3536 9700

### INDIA

ANDRITZ Technologies PVT Ltd.  
p: +91 11 4937 2900

### BRAZIL

ANDRITZ Brasil Ltda.  
p: +55 41 2103 7601

### CANADA

ANDRITZ Ltd.  
p: +1 514 631 7700

### USA

ANDRITZ Inc., Beloit  
p: +1 815 389 8200

ANDRITZ Inc., Glens Falls  
p: +1 518 683 5793

ANDRITZ Inc., Springfield  
p: +1 413 733 6603

**PAPERBOARD@ANDRITZ.COM**  
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