



31/2016

PROMOTIONAL

MAGAZINE

Paper | Tissue | Build-To-Print | Services | Specialty Products

**HOW TO EFFECTIVELY IMPROVE
PAPER QUALITY?**
A MODERN HYDRAULIC HEADBOX
AS A COST EFFECTIVE WAY TO
ENHANCE PM PERFORMANCE

**ECOEC REVOLUTION
HAS BEGUN!**

CASE STUDIES
REAL LIFE EXAMPLES OF EXECUTED PROJECTS
TIPS FOR A SUCCESSFUL REBUILD

**INTEGRATED TISSUE MILL AS
AN IDEA TO INCREASE
PRODUCTION EFFICIENCY**

**MUST HAVE SOLUTIONS TO
MINIMIZE MEDIA CONSUMPTION**

**CAN A NEWSPRINT PM RISE FROM THE
ASHES LIKE A PHOENIX? - SMART PM
RE-PROFILING IDEAS**





**“From my point of view,
this constant statement
“price, quality and
technology”
is exactly what
PMP Group offers.”**

**- Sergey Pogodin,
SFT Group**

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BECAUSE PASSION COMES FIRST...

Dear Readers,

The world is much smaller nowadays than a decade ago – it is so easy to find information, a new vendor or a product we need. According to Harvard Business Review while 90% of customers begin their search of a solution online, a startling 60% of the buying decision is made before even speaking with a potential business partner.

Investors are coming to the table armed to the teeth with a deep understating of their needs. So they expect from their suppliers to challenge them and push them outside their comfort zone to create an added value. Each time they measure supplier's ability to deliver new insights.

That is why PMP has gone recently through a significant metamorphosis and launched a rebranding initiative. Our strategic goal is to increase our focus on being a customer driven supplier of investment goods that create opportunities. We want to be perceived as a technological integrator, strong and agile. A new tagline "Passion Comes First" sums up PMP's vision of our unique approach to company performance and teamwork. We believe that the real engine for success is people who drive business forward. Those people are ready to create new insights for our partners.

We are and we want to be in a state of flux. To collected knowledge about market trends, to listen carefully and offer provocative insights about what our customers should do. That is why we want to share our knowledge & experience and put a premium focus on our customers' agility to reexamine the status quo.

Hopefully this new issue of our PMP Pomo Magazine becomes a source of inspiration for you. Our goal is to warm you up before face to face meetings with PMP team.

ASIA

PMP (7) TISSUE MACHINES IN YFY'S FLEET UP & RUNNING

On 8th December 2015 (TM#1) and on 14th January 2016 (TM#2) in Ding-fung, China, 6th and 7th machine delivered by PMP, were successfully brought on stream bringing all involved satisfaction & pride. At present, in the tissue area, YFY owns 7 PMP Intelli-Tissue® 1600 lines – all are installed in Mainland China. Recent (2) tissue machines are 2.8 (110 inch) reel trim CF type tissue machines with an operating speed of 1,600 mpm (5,250 fpm) and daily capacity of 80 tpd each. Machines are producing virgin fiber-based tissue in the basis weight range at the reel from 13 to 31.3 gsm (8-19.1 lbs/3000 ft²) for conversion into facial tissue, toilet rolls and kitchen towels.

PMP TO SUPPLY (2) INTELLI-TISSUE® 1200 ECOEC TISSUE MACHINES FOR HEBEI JINBOSHI GROUP CO., LTD, CHINA

On 22nd January 2016, PMP signed a contract with Heibei Jinboshi Group CO., LTD for the delivery of (2) Intelli-Tissue® 1200 EcoEc lines. The (2) Intelli-Tissue® 1200 EcoEc will be characterized with 3650mm reel trim, operating speed of 1200 m/min, daily capacity 75 t/d and a basis weight 12.5-25 gsm each. The PMP's scope of supply will cover the single layer Intelli-Jet V® hydraulic Headbox, 4-roll Intelli-Former®, compact Intelli-Press®, 12ft Steel Intelli-YD™, Intelli-Hood™ and Intelli-Reel®. In addition, PMP will provide mechanical drives, electrical drives, lubrication system, Steam & Condensate system and the PLC. The PMP team will also provide erection supervision and technological start-up. The start-up is scheduled for the end of 2016 (1st machine) and the middle of 2017 (2nd machine).

2ND PMP INTELLI-TISSUE® ECOEC TISSUE MACHINE SMOOTHLY LAUNCHED IN HEBEI XUESONG PAPER, CHINA

On January 16th 2016, PMP successfully started up 2nd Intelli-Tissue® 1200 EcoEc at Hebei Xuesong mill. TM#2 (twin sister line to TM#1) is characterized by reel trim of 2850 mm, design speed of 1200 m/min and daily capacity 60 t/d (basis weight 12.5-20 gsm). After TM#2 installation, Hebei Xuesong Paper have two machines (right and left hand) in the same building based on an Integrated Tissue Mill concept. PMP has provided a stock approach system, Intelli-Tissue® 1200 EcoEc machine, mechanical drives, electrical drives, a lubrication system, a steam & condensate system and PLC. The PMP team has also been responsible for an erection supervision and technological start-up.

YUEN FOONG YU (YFY) HAS SIGNED ANOTHER CONTRACT WITH PMP - STRATEGIC PARTNERSHIP IS SUCCESSFULLY CONTINUED

In October 2015, Yuen Foong Yu has signed a contract with PMP for rebuild of TM#7 in Ching Shui Mill (Taiwan). This time, the scope of supply covers 12' steel Intelli-YDTM, designed and manufactured by PMP (2420 mm sheet width on Yankee), a high efficiency Yankee cap supplied with an air fan – Intelli-Cap™ – and a Steam & Condensate equipment. Intelli-YDTM designed for YFY will be capable to operate up to 9.5 bar(g) of steam pressure and a maximum design speed of 1200 mpm. The delivery is scheduled on June 2016, followed by erection at site and start-up on August 2016.

EUROPE

PMP SUCCESSFULLY COMPLETED PM#4 WET END REBUILD FOR SMURFIT KAPPA, SAILLAT, FRANCE

In April 2015, PMP was awarded by Smurfit Kappa Saillat (France) a PM#4 wet end rebuild. Thus it is our pleasure to announce that on January 8th 2016 at 7:00 p.m. local time, PM#4 was successfully brought on stream. At the same time, saleable paper parameters has been achieved just 1.5 hour later. PMP's scope of delivery included a 4 channel Intelli-Jet V® (hydraulic headbox) for a top ply, a pressure pulsation attenuator system, a temperature control system and a wire rebuild (top ply mini-Fourdrinier). PMP was responsible also for a Vacuum System, on site erection and start-up supervision.

PMP SUCCESSFULLY IMPLEMENTS ANOTHER INTELLI-NIP® SHOE PRESS – NEW PRESS SECTION INTELLI-PRESS® FOR PM#1 APIS SZCZECIN - SKOLWIN, POLAND

In February 2016, PMP launched an Intelli-Nip® Shoe Press as a core technological item of a new press section Intelli-Press® for Apis Sp. z o.o., Szczecin-Skolwin, Poland. The customer decided to re-start an existing PM#1, originally built by Fampa (a predecessor of PMP), and change its production profile from newsprint into fluting and liner grades. PMP designed a modern Intelli-Press®, including 3 nips: a plain roll – on the 1st position (nip load 90 kN/m), a suction roll – on the 2nd position (nip load 30-40 kN/m) and the Intelli-Nip® Shoe Press on the 3rd position (design nip load 750 kN/m, module type: 1300). PMP was also responsible for: pre-assembly services of the press section, movement tests before shipment, logistics, on site services including: erection, commissioning, start-up, training and optimization.

NORTH AMERICA

PMP TO SUPPLY A PHOENIX CONCEPT™ PROJECT FOR A REBORN PAPERMAKING LINE FOR SMURFIT KAPPA MEXICO

In 2015, PMP signed a contract with Smurfit Kappa Mexico (Los Reyes mill) for a rebuild of a reborn papermaking line. PMP will deliver a 5 channel Intelli-Jet V® hydraulic headbox (pondside: 2675 mm), new press section Intelli Tri-Nip™ equipped with a reused Shoe Press (module 1500), as well as new Intelli-Dryer® after dryer section. In addition PMP will provide fourdrinier extension, tail threading system upgrade, a reel rebuild, new mechanical drives and essential replacement parts. PMP will also execute vast scope of services including start-up supervision. The start-up is scheduled for 1st quarter of 2017.

PMP SIGNED A CONTRACT FOR A NEW INTELLI-JET V® FOR CUSTOMER IN NORTH AMERICA

In May 2014, PMP signed a contract for a Intelli-Jet V® hydraulic headbox for a leading paper producer in USA. Scope of delivery includes almost 10m (370 in) pondside Intelli-Jet V® headbox that will be equipped with a Consistency Profiling (CP) System in order to improve basis weight profile. The start-up is scheduled for May 2016.

A BRAND NEW INTELLI-REEL® SUCCESSFULLY IMPLEMENTED IN NORTH AMERICA!

PMP is continuing expansion in North America. Another project has just been successfully completed! This time PMP has launched a brand new Intelli-Reel® of trim over 5600 mm (220') in the mill located in southern USA. The unit ensures safe, repeatable and stable winding. As a consequence winding defects and sheet losses are significantly reduced.

AFRICA

PMP TO SUPPLY A NEW INTELLI-TISSUE® 1600 ADVANCED TO SOUTH AFRICA

In December 2014, PMP signed a contract for a delivery of a complete new Intelli-Tissue® 1600 Advanced Tissue Making Line for a customer in South Africa. The start-up is scheduled for the end of 2016.

SOUTH AMERICA

SMURFIT KAPPA COLOMBIA HAS SIGNED A CONTRACT WITH PMP FOR PM#1 PRESS PART REBUILD

In January 2016, Smurfit Kappa signed another contract with PMP for a press part rebuild of PM#1 in its Mill in Barbosa (Colombia). PMP's scope of delivery includes the Intelli Tri-Nip® Press section with the Intelli-Nip® Shoe Module (design nip load 1400 kN/m, shoe press module type 1300). A compact design of a new press section Intelli Tri-Nip® will ensure reduction of open draws and significantly increase PM#1's runnability. The shoe press technology is going to play a key role in the final success, bringing ultra-high dryness. Scope of covers also Intelli-DCR® (Deflection-Compensation Roll), as well as PM auxiliaries. Structural machine components will be designed for a design speed of 1000 m/min. PMP will also be responsible for on-site services, including on-site erection and start-up supervision. The delivery is scheduled for November 2016, followed by erection on site and start-up by the turn of 2016/2017.



PMP – PAPER MACHINERY PRODUCER

Industry:	Industrial Machinery & Services (Especially for Pulp, Paper and Tissue Industries)
Founded:	1854 – over 160 years of experience
Headquarters:	PMPoland S.A., Jelenia Góra, Poland
No. of locations:	6
Area served:	Worldwide
Key people:	Mr. Zbigniew Manugiewicz (CEO) Mr. Aaron Braaten (Chairman)
Products:	Paper making lines Tissue making lines Build-to-Print Specialty Products
Servies:	Services for the paper industry Engineering services
Revenue:	48 mln EUR (2015)
No. of employees:	600

It has been over 160 years since PMP became involved in the paper industry. During those decades, due to historical, political and economic reasons, the company went through many transformations and take-overs. The name changed from H. Füllner, Fampa, Beloit Poland to finally be established (in the year 2000) as an independent, global corporation – PMP Group.

Currently, PMP is present all over the world. By having 6 divisions on three major continents (Europe, North America and Asia), the company is able to offer high quality products and services for a reasonable price. Favorable location gives also the opportunity to be close to its customers.

As a global corporation, PMP is focused mainly on five business areas: paper, tissue, build-to-print, specialty products and services.





PMP INTRODUCES NEW BRANDING INITIATIVE

In December 2015, PMP has refreshed its branding, implementing a new logo and visual identity. PMP's image modernization is a response to the significant metamorphosis that the company has gone through within the last couple of years and is an element of PMP's new strategy for the years 2016-2018.

Through successful execution of capital projects for esteemed partners worldwide, PMP has become a more mature and conscientious organization with revenue of 48 mln EURO (FY 2015). Today PMP's products and solutions can be found in 33 countries on six continents, including key references in a diverse array of pulp and paper corporations. PMP has opened new facilities in the United States, China, and Italy to facilitate service to its customers. Over the years, PMP's strategy has evolved from a Low Cost Solutions philosophy (price based competitive advantage) into Optimum Cost Solutions (technology based competitive advantage). PMP's defined Code of Values focused on partnership and an ethical business approach has been the best indication of its endeavors.

Going forward, PMP's strategic goal is to increase its focus on being a customer driven supplier of investment goods that create opportunities and add value. PMP wants to be perceived as a technological integrator, strong and agile. PMP's target is to increase its market share by 20% within the next 3 years, with a specific focus on the Americas.

Recently PMP has embarked on a fundamental evaluation of who they are, what they do, and how they do it. As they have evolved over the past several years from a “best price” to an “best technological solution” philosophy they have found that in every area of the world they are being referred to simply as “PMP”.



Old Logo



New Logo

PMP's new logo was developed after consultation with its clients, partners and employees and is designed to better correspond with how the world perceives the company. This PMP logo evokes technology and passion. The black and green palette is inspired by over 160 years of company history. The round elements are associated with the rotating parts of machinery and symbolize continued growth. A green arrow indicates further company development and upward progress while a modern font underlines the significance of state-of-the-art technology driven by proven solutions.

A new tagline “Passion Comes First” sums up PMP's vision of its unique approach to company performance and teamwork. PMP believes that the real engine for success is people who drive business forward. This approach appreciates the human side of activity and emotions that shape uniqueness of individuals. One of PMP's ideas is to make its employees proud of their personal and team achievements, empower their undiscovered abilities and strengthen their loyalty.

PMP's new visual identity as well as their new promo campaign “Passion Comes First” underlining PMP's refreshed and proactive approach to cooperation with its partners around the globe has been officially launched on December 14th, 2015.



INTERESTING FACTS ABOUT POLAND

**Dzień
Dobry!**

Polish language

Polish is the official language of Poland. It is considered as one of the world's most difficult languages. One of the most famous Polish tongue twisters is: **"W Szczębrzeszynie chrząszcz brzmi w trzcinie"** [ʃɛʃbʒɛʂɨɲɛ xʂɔũʃt ɕ bʒmʲi ftʂɛ ɕɨɲɛ], which simply means "In Szczębrzeszyn a beetle sounds in the reeds"

Climate

The Polish climate is moderate Continental. Winters are relatively cold, with average temperatures between -1°C to -5°C (30.0 and 23.0 °F) and hot summers with average temperatures between 18 and 30°C (64.4 and 86.0 °F) depending on a region.

23-86 °F

White stork

White storks are one of Polish symbols. Poland is host to the largest white stork population in Europe. Each spring about 25% of the total population of white storks fly to Poland.

Capital city:
Warsaw

Population:
38 million

Currency:
1 Złoty

Calling code:
+48

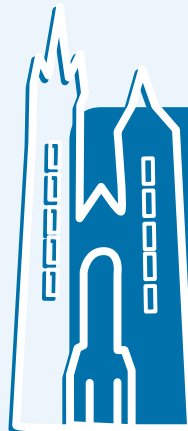


National symbols

Flag



National emblem



Cracow

1364

Its stunning architecture and treasures of art attract thousands of tourists each year. It is considered the cradle of the Polish science because the first Polish university, the Jagiellonian University, was founded here in 1364. Today, it is known as one of the most beautiful cities in Europe with about 10 million tourists visits each year!

Hospitality

Poland is well known from its... hospitality. Prepare to be overwhelmed by the exceptional hospitality of the Polish people.



443 ft

Wieliczka Salt Mine



Wieliczka Salt Mine build in the 13th century is one of the world's old salt mines that was still in operation until 2007. Wieliczka is cocated 135 meters (443 ft) underground and was entered into the UNESCO First World Heritage List in 1978.

Oscypek Cheese



Oscypek is a famous Polish smoked cheese made from sheep's milk by Polish highlanders.

Frederic Chopin

Famous musical composer Frederic Chopin was Polish and he was born in Żelazowa Wola, a village in east-central Poland. Chopin was composing and writing poetry at six, and gave his first public concerto performance at the age of eight.

Architecture



Majestic castles, gothic side streets, sprawling market squares.... Polish towns combine medieval architecture with lively cultural activities to meet the needs of modern tourists.

John Paul II

Poland is the land of Pope John Paul II. He served as Pope from 1978 to 2005 and was known as the pope who was loved by whole world. Pope John Paul II, born Karol Wojtyła, was officially declared a saint by the Vatican on 27 April 2014.

Amber

Poland is world's biggest amber exporter.

Nobel Prize

Poland boasts 17 Nobel Prize winners including Maria Skłodowska Curie who conducted pioneering research on radioactivity. She was the first woman to win a Nobel Prize, the first person and only woman to win twice, the only person to win twice in multiple sciences.

Nicolaus Copernicus

Polish astronomer Nicolaus Copernicus was the first person who found out that the Earth was not the center of the Universe.

The land of brave and stout-hearted people

Poland has been invaded or has fought for freedom in insurrections 43 times from 1600 to 1945.

Constitution

Polish constitution was first in Europe, and second in the World. (1791)

Pierogi

"Pierogi" are filled dumplings, which are the symbol of Polish cuisine. They have been eaten in Poland since the Middle Ages. There are various fillings but most famous are pierogi with mashed potatoes and cheese, as well as pierogi with cabbage and mushrooms.

Untouched nature

Poland is probably one of the best places to explore the untouched nature. Our country is still rich in pristine national parks and protected areas. After a busy day you can escape to the nature and just enjoy and recharge yourself.

pmp



PMPoland S.A.



Contact:

Phone: +48 75 755 10 61

E-mail: marketing@pmpgroup.com

Location: Jelenia Góra Poland,
PMP Group Headquarters

Main responsibilities:

- Technology development
- P&P capital project execution
- Marketing
- Application/Sales
- Designing
- Engineering
- Erection services
- Field Services
- Service Center for Europe



ROLLS & SERVICE

**PMP Rolls & Service
Sp. z o.o.**



Contact:

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Location: Świecie, Poland

Main responsibilities:

- Rolls manufacturing
- Rolls services
- Refurbishment services
- Maintenance services



KONMET

**PMPKonmet
Sp. z o.o.**



Contact:

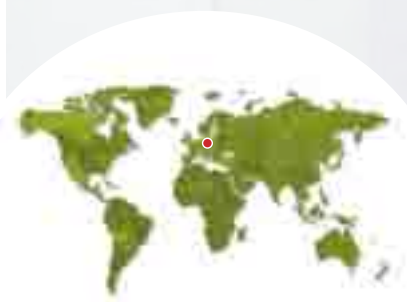
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Location: Jelenia Góra, Poland

Main responsibilities:

- Build-To-Print projects
- Mild steel structures



VISIONS



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Location: Machesney Park, USA
Service Center – North America

Main responsibilities:

- Liaison for PMP P&P business
- Gauging & Fixturing
- Subcontract Manufacturing
- Service Center for North America



**PMP IB
(Changzhou)
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& Technology Co. Ltd.**



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Location: Changzhou, China
Service Center – Asia

Main responsibilities:

- Center of Excellence for EcoEc Tissue Machines
- Engineering & manufacturing support for capital projects
- Service center for Asia



PMPower S.r.l.



Contact:

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E-mail: info@pmpower.it

Location: Lucca, Italy

Main responsibilities:

- Energy solutions for TMs and PMs
- Intelli hoods/steam & condensate
- Ventilation & air system
- Transfer & stab box
- Runnability systems
- Plant surveys & upgrades



pmp

HEADQUARTES INSIGHT - PMPOLAND S.A.

PMPOLAND S.A.

Location: Jelenia Góra, Poland

Main responsibilities:

- **Capital project execution**
- **Designing**
- **Technology development**
- **Key technological section manufacturing**
- **PMP Service Center of Europe**

Leadership:

Mr. Zbigniew Manugiewicz
(President & CEO PMP Group)

SHORT HISTORY OVERVIEW

In 2014 it was the 160th anniversary of Heinrich Füllner establishing a workshop for paper devices in Cieplice (a district of Jelenia Góra), which at the end of the 19th century became a well-known paper machinery producer in Europe. Customers from Europe as well as from Asia and South America bought complete paper technological lines from Cieplice due to their high quality. The machines designed by companies H. Füllner, then Fampa and Beloit Poland S.A. significantly influenced the paper industry development in Jelenia Góra region, as well as in Silesia, Germany, Poland and in many more countries all over the world. The honourable role is continued to this day by PMPoland S.A. as a successor of over 160 years of paper machinery building tradition.

PMPOLAND S.A. MAIN RESPONSIBILITIES

Today PMPoland S.A. is a headquarters of whole corporation, which is connecting all divisions under one sign of PMP Group. Main responsibility of PMPoland S.A. is execution of capital projects for the paper industry.

PMPoland offers complete paper machines for special papers (like MG) and packaging units, described by the Intelli-Paper® platform, as well as complete technological tissue making lines, under brand Intelli-Tissue®. Product portfolio in this area covers also Stock Preparation, Stock Approach and all new sections of machines. Due to the high demand on the market in regard to leading complex added-value projects, PMPoland S.A. is executing also a so called Phoenix Concept™ rebuilds.

PMPoland S.A. provides also variety of engineering services (for both, tissue and paper industry), that are based on experience and modern tools such as 3D Solid Works, CosmosWorks, CadSimplus, E-plan and DB Works. What is more, PMPoland S.A. service portfolio covers anything from erection supervision groups, safety audits, periodical surveys and repairs of rolls, small repairs of existing equipment (like pumps, blowers or corroded constructions) and many more.

Other responsibility of PMP Group's headquarters is Build-to-Print Business, where PMPoland S.A. offers precision machining, fabrication and assembly of complex and large machinery, based on documentation provided by the customer.

PMPoland S.A. product and reference portfolio is vast and divers. This diversity allows to assure a stable posi-





tion on the market, which eventually resolves in the company's reliability.

PMP'S HEADQUARTERS LOCATION

PMPoland S.A. is located in Jelenia Góra, in southwestern Poland, along the border with the Czech Republic. The name of the city means "Deer Mountain".



Jelenia Góra is a city with over 900 years old history and tradition, many monuments and tourist attractions, it's also a perfect starting point for hiking in the mountains. The Jelenia Góra is one of the most interesting and the oldest cultural landscape of our region. In the city and it's nearby area you can encounter defensive churches, penitential crosses, old cabins, medieval fortresses and palaces surrounded by romantic parks.

By the tourist trails there are many mountain shelters where a weary tourists can rest while experiencing the history of the region. Jelenia Góra is a perfect place to start a trip to surrounding mountain ranges: Karkonosze, Rudawy Janowickie, Kaczawskie Mountain and Izerskie Mountain.

No doubts, it is an exceptionally unique place with a thousand years of history of three nations and a multitude of cultures. From the windows in PMPoland you can see the view on the Śnieżka Mountain, which is the highest peak in the Karkonosze Mountains (1602 meters mamsl).

...feel invited to visit PMP's headquarters and to discover the beauty of our region!



ROCKY MATUSKA
GENERAL MANAGER
- PMP AMERICAS

PMP AMERICAS

- MEET OUR EXPERTS FROM USA

PMP AMERICAS INC.

Location: Machesney Park, USA

Main responsibilities:

- **Outsourcing Solutions**
- **Reverse Engineering**
- **Gauging & Fixturing**
- **Build-to-Print**
- **Sales & engineering liaison for PMP (North America)**

Leadership:

Mr. Rocky Matuska
(General Manager)

PMP AMERICAS BUSINESS PROFILE OVERVIEW

PMP Americas is one of PMP's divisions, located in Machesney Park, Illinois (near Chicago). The facility has been manufacturing parts in the Build-To-Print Business, especially in the aerospace and automotive industries. PMP Americas is the link between PMPoland S.A. and the US market and provide corporate support in the area of the paper industry. PMP Americas is the PMP's main branch responsible for manufacturing Specialty Products.

In the area of paper industry, PMP Americas is responsible for North American market and support in implementation of projects in this area. With the US team, the company is able to provide better communication (in the native language of customers) and a rapid response to the needs of buyers in this part of the world. Representatives of the PMP Americas are supporting PMP's headquarters at every stage of the project - from signing the contract until the start-up.



LOCATION

PMP Americas is located in Machesney Park, Illinois, United States. The area of Machesney Park is well known for its attractive residential setting along the Rock River. The Village is well positioned for convenient access to Chicago, Madison and Milwaukee. Machesney Park is known for its friendly expanding business community, reputable schools and access to recreation. While the Machesney Park area is rooted in history, the Village is relatively young only having incorporated into a Village in 1981.

Machesney has world class parks and recreational facilities for all ages and interests. From hiking, picnicking, golfing and active sports to water sports and off-leash dog runs, Machesney Park area has something to offer for everyone.



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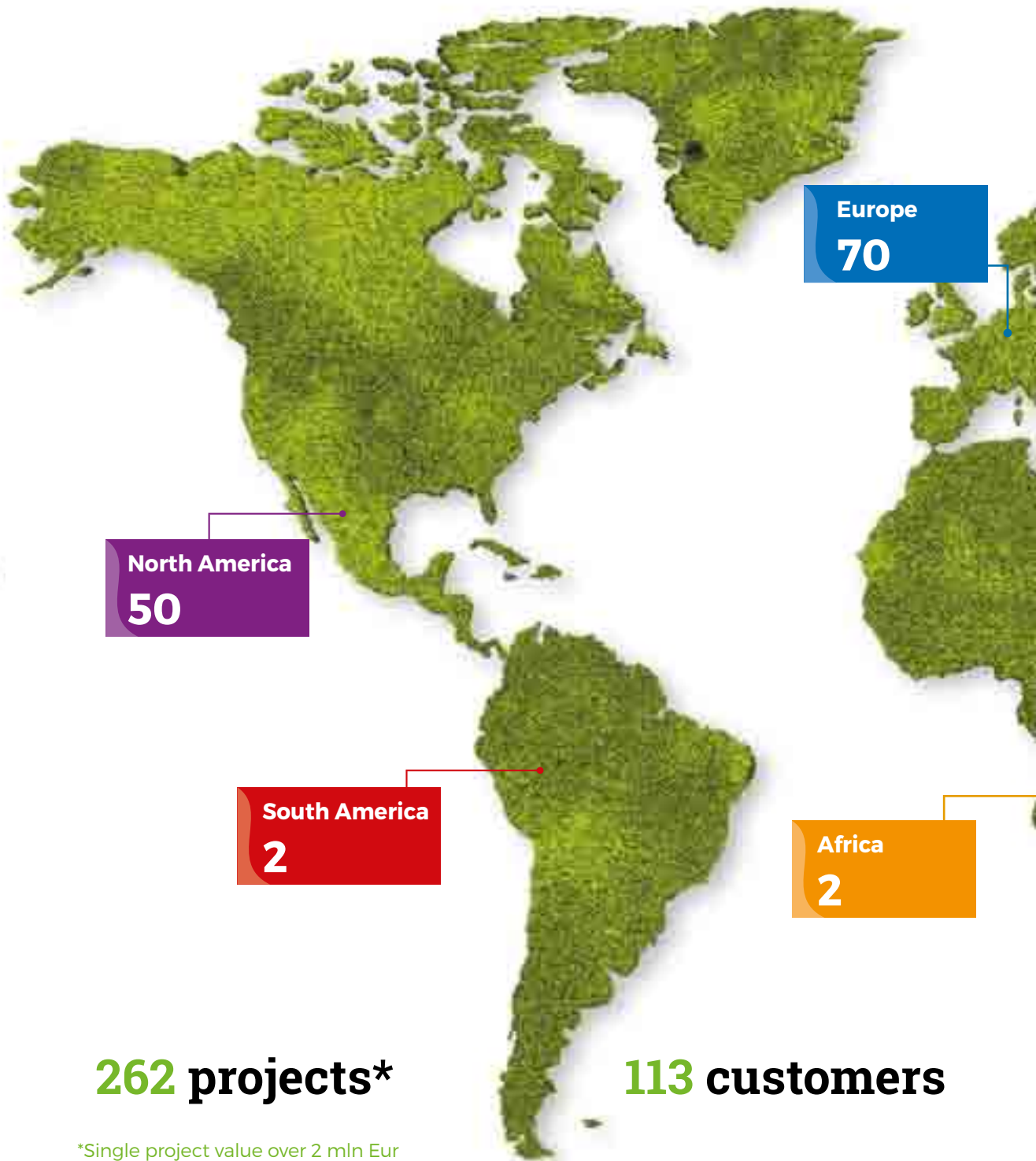
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AUSTRALIA
NEW ZEALAND

Quest Paper Services

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PMP Global

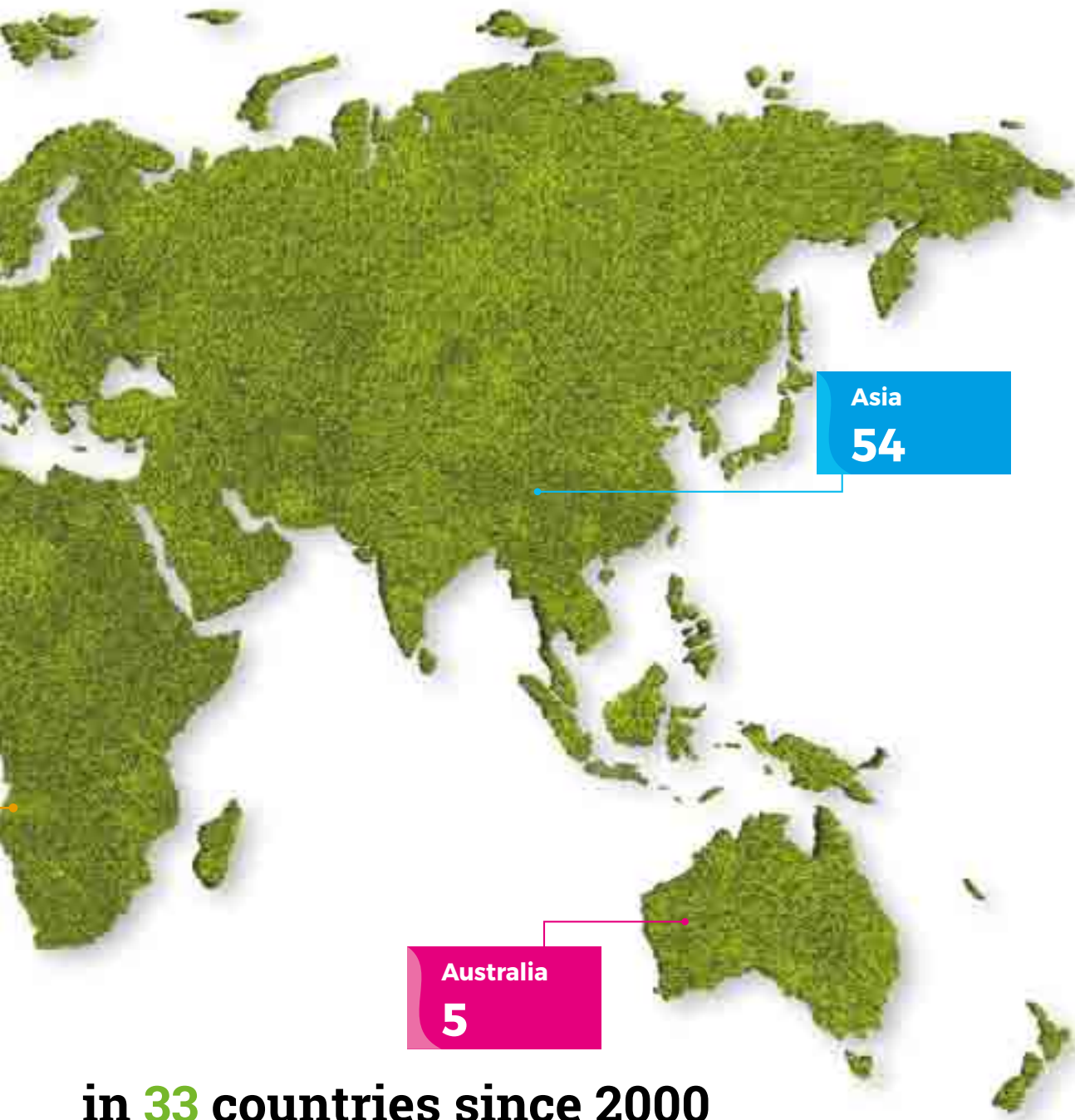


262 projects*

113 customers

*Single project value over 2 mln Eur

References



in 33 countries since 2000



REEL



Design speed:	Up to 5000 fpm	Up to 1500 mpm
Paper width:	Up to 400 in	Up to 10 m
Hydraulic or pneumatic operated		



METERING SIZE PRESS

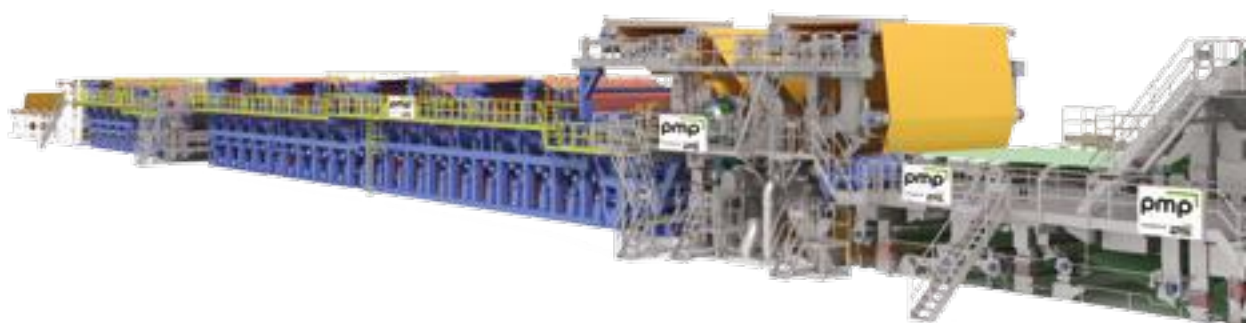


Paper width:	Up to 400 in	Up to 10 m
Design speed:	Up to 4920 fpm	Up to 1500 mpm
Sizing agent:	Starch, PVA, pigment	Starch, PVA, pigment
Solids content:	Up to 18% (starch)	Up to 18% (starch)
Surface sizing weight:	Up to 1.2 lbs/3000ft ²	Up to 6 gsm
High quality rods and holders		
Quick change rolls		



MICROCREPE

Design speed:	Up to 990-4000 fpm
Paper width:	130-280 in
Paper grades:	Sack paper



PRESS SECTION



Paper width:	Up to 400 in	Up to 10 m
Shoe Press module dia:	51 in, 60 in	1300 mm, 1500 mm
Counter rolls:	Plain, Intelli-DCR™	Plain, Intelli-DCR™
Configuration:	Up - right, inverted	Up - right, inverted
Nip range:	Up to 8000 PLI	Up to 1400 kN/m



FORMER



Paper width:	Up to 400 in	Up to 7.5 m
Design speed:	1000-4000 fpm	300 - 1200 mpm
Basis weight:	6-40 lbs/3000ft ²	30 - 200 gsm
Type:	4 or 5 wire roll type	4 or 5 wire roll type



intelli
MICRO-CREPE

Up to 900 mpm

3.4 - 7.0 m

Sack paper

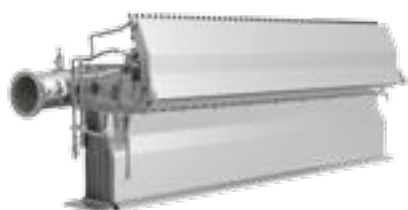


DRYING SECTION

intelli
DRYER

Paper width:	Up to 400 in	Up to 10 m
Design speed:	Up to 4920 fpm	Up to 1500 mpm
Drying cylinders:	60 in or 72 in	1524 mm or 1830 mm
Pressure ratings:	10 bar	10 bar
Arrangement:	Single-tier or double-tier	Single-tier or double-tier
Drive:	By felt rolls (silent drive)	By felt rolls (silent drive)

Ropeless threading for higher speeds



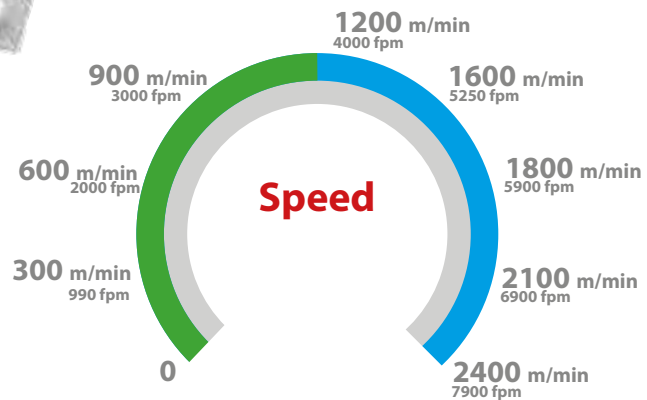
HYDRAULIC HEADBOX

intelli
JET-V

Pondside:	Up to 400 in	Up to 10 m
Design speed:	Up to 4920 fpm	Up to 1500 mpm
Basis weight:	12-250 lbs/3000ft ²	20 - 400 gsm
Type:	Hydraulic (with or without CP)	Hydraulic (with or without CP)
No. of channels:	2-12	2-12
No. of layers:	Single or multilayer	Single or multilayer

PMP Platform Concept for Papermakers

- Complete MG & Containerboard Making Lines (reel trim: up to 280')
- PM Conversions Phoenix Concept™ Rebuilds
- Stock Approach System
- New sections of PMs (up to 390'):
 - ✓ Intelli-Jet V® Hydraulic Headbox
 - ✓ Intelli-Shaker™
 - ✓ Intelli-Top® Former
 - ✓ Intelli-Nip® Shoe Press
 - ✓ Intelli-DCR™
 - ✓ Intelli-TriNip™ Press
 - ✓ Intelli-Sizer™ Metering Size Press
 - ✓ Intelli-MicroCrepe™ Extensible Unit
 - ✓ Intelli-Dryer®
 - ✓ Intelli-Reel®
- Auxiliary Systems
- Energy Saving Solutions
- Engineering Consulting Services





PMP Platform Concept for Tissuemakers

- Complete Crescent Former Tissue Making Lines (capacity: up to 200 tpd, reel trim: up to 220')
- Stock Preparation & Stock Approach Systems
- New sections of TMs:
 - ✓ Intelli-Jet V® Hydraulic Headbox
 - ✓ Intelli-Former® Crescent Former
 - ✓ Intelli-Press®
 - ✓ Steel Intelli-YD™
 - ✓ Intelli-Hood™
 - ✓ Intelli-Reel®
- Auxiliary Systems
- Energy Saving Solutions
- Engineering Consulting Services

Intelli-Tissue® Advanced 1600	
Speed	1560-2100 m/min (5000-6900 fpm)
Capacity	Over 75 tpd

PHOENIX CONCEPT™

- A NEW VALUE FOR EXISTING MACHINERY

BENEFITS:

- PM CONVERSIONS OPPORTUNITIES (newsprint into containerboard / tissue or heavy into lighter containerboard grades)
- CAPACITY INCREASE up to **25%**
- PAPER PROPERTIES improvement
- UP TO **50%** investment cost savings
- Production line RELOCATION POSSIBILITIES



Sample references:

Customer:	Scope of supply:
Confidential, United Kingdom	PM transfer & rebuild (including new Intelli-Nip® Shoe Press), supply, refurbishment and commissioning services
Smurfit Cartón y Papel de México, S.A. de C.V. Molino, Los Reyes, Mexico	Hydraulic Headbox Intelli Jet V® with CP, wire modification, IBS dewatering rebuild (Intelli Tri-Nip™), dryer and pre-dryer section rebuild, size-press rebuild, upgrade, mechanical drives
SFT, Aleksinskaya Paper and Board, Russia	Second-hand PM refurbishment, wet-end rebuild, Intelli-Jet V® Hydraulic Nip® Shoe Press, Intelli-Size™ Metering Size Press, dryer section modernization
Niederauer Muhle GmbH, Germany	PM transfer & rebuild (Press section rebuild, minifourdrinier + Intelli-Jet V® tom wire extension, two new dryer groups, new Intelli-Reel®)



Main Features:

- Precise calculation
- On site measurement
- Scheduling
- Design of the new equipment (tailor made solutions)
- Manufacturing of new core technological units
- Pre-Assembly at PMP facility
- All necessary tests
- Transportation to the mill site
- Adjustment
- Optical alignment and erection at site
- Engineering commissioning
- Technological start-up and post start-up assist
- PM/TM relocations
- PM/TM profile change

	Project goals:
ishment, erection	Production profile modification (based on relocated machine), reduction of investment costs, combining new technological elements with refurbished parts
g elements, press uild, tail threading	Increasing capacity to 170 000 t/a, product portfolio widening (fluting/liner)
c Headbox, Intelli- zation	Production profile modification (based on relocated machine), reduction of investment costs, combining new technological elements with refurbished parts
top headbox, bot-	Production profile modification, reduction of investment cost, combining new technological elements with refurbished parts

PMP BUILD-TO-PRINT BUSINESS

Scope of supply:

- Wide scope of manufacturing services applied to execute customers' products (based on provided design)
- Single units as well as complex line concepts
- Manufacturing based on CNC controlled tools
- Sample projects include tanks, silos, chests, bridges and building constructions, fan housings, air transmission installations, machine constructions, foot-paces, ladders and stairs
- Manufacturing centers located in Poland, China and USA



**FLEXIBLE SOLUTIONS
FOR HEAVY INDUSTRIES**

Build-to-Print is a part of PMP's business area that offers precise machining, fabrication and assembly of complex and large machinery based on documentation provided by the customer.

Supporting chemical, food, shipbuilding, mining, brewing, automotive and many other industries.

BENEFITS:

- **OVERSIZE** items manufacturing
- **HIGH QUALITY MATERIALS** (Stainless steel, mild steel, aluminium, tungsten carbide, delrin)
- **ON TIME** delivery
- **METRIC & IMPERIAL** designs
- **CNC machinery in house – PRECISE EXECUTION**

SPECIALTY PRODUCTS

Scope of supply:

Gauging & Fixturing

- Production & Assembly for automotive, aerospace and general production facilities
- Gauges to check incoming part tolerances and final assembly tolerances
- For work-holding & assembly to decrease manufacturing and assembly Times

PRECISION COMES FIRST

PMP designs and build custom gauges and fixtures for production and assembly lines for the automotive, aerospace and also for General Production facilities.

PMP will designs and builds specialty products that meet your needs.

BENEFITS:

- **ERGONOMIC DESIGNS** – safe & help to reduce strain on your employees
- **ON TIME** delivery
- **CONFIDENTIAL** agreements
- **CNC machinery in house - PRECISE EXECUTION**



REPLACEMENT PARTS

PMP provides wide range of replacement parts for own PM/TM as well as for other existing lines.

Scope of supply:

- Components for all possible areas of PM/TMs
- Metric & imperial designs
- Standard or custom-made designing (reverse engineering)



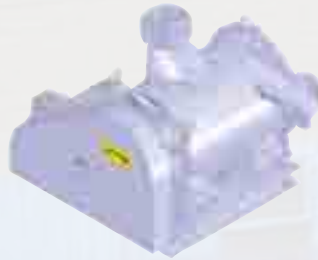
**TAILOR MADE DESIGNS TO MEET
YOUR EXPECTATIONS**

BENEFITS:

- MODERN DESIGNS meeting demanding expectations
- User-FRIENDLY SOLUTIONS
- HIGH QUALITY, certified materials application
- Meeting worldwide SAFETY REQUIREMENTS & REGULATIONS
- Properly PACKED & INSURED

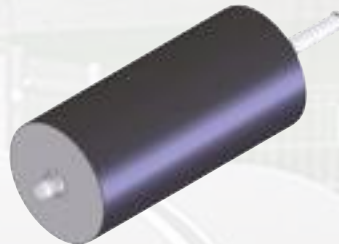
STOCK PREPARATION & STOCK APPROACH

- Low pulsation screen
- Hydropulper rotor



WET-END

- Headbox replacement parts: apron lip, apron table, slice lip
- Wire rolls
- Forming rolls
- Suction couch roll
- Guides & stretchers
- Suction boxes
- Doctors
- Footwalks (stainless & aluminium)



PRESS

- Press rolls
- Suction rolls
- Suction boxes
- Guides & stretchers
- Doctors
- Footwalks (stainless & aluminium)



DRY-END

- Dryer felt rolls
- Size press rolls
- Dryer cans
- Tail cutter
- Doctors
- Reel drum
- Reel spool
- Footwalks (stainless & aluminium)



PMP

FIELD SERVICES



KEEPING YOUR MACHINES
IN A GREAT SHAPE!

Interested to keep your PM running smoothly? Feel free to choose our experienced service team.

Routine maintenance or emergency repairs needed? Contact us!



Scope of supply:

- PM/TM pre-erection & erection at site
- PM units routine check-outs
- Emergency repairs
- PM optical measurements
- Refurbishment services
- Disassembly & relocation of existing PMs



BENEFITS:

- COMPLEX approach
- Wide scope of ACTIVITIES FROM A TO Z
- Incorporation of refurbished machinery into EXISTING PAPERMAKING LINES
- HIGH SKILLED SPECIALISTS with vast experience collected worldwide
- Paper mills can be reached by PMP specialist within 24 HOURS IN EUROPE, ASIA & NORTH AMERICA
- Being in line with EU REGULATIONS & RECOMMENDATIONS (CE)



PMP as a technological company offers a wide range of engineering services starting from application to advisory services.

PMP within the engineering services co-operate with the paper industry, as well as with other industry partners.

Scope of activities:

- Application/ Designing/ Detailing (Mechanical & Controls)
- Product development
- Terminal points definition
- Approval meetings support
- In-house manufacturing with continuous supervision
- Technological Services (commisioning, start-up, PM/TM optimization)
- Existing lines troubleshooting (dynamic stability / vibration analysis and more)
- Safety analysis

BENEFITS:

- Wide proces knowledge for **EFFICIENT PROJECT EXECUTION**
- **EXPERIENCED** & dedicated team
- **FLEXIBILITY** in action
- In-house annual capacity of **75,000**
- **MODERN ENGINEERING SOFTWARE** (SolidWorks, CosmosWorks, CadSimplus, E-plan, DBWokrs) – shorter execution cycles
- Cooperation with industry **EXPERTS/ADVISORS**
- **METRIC & IMPERIAL** designs
- English as a **COMMON LANGUAGE** of communication



**A GREAT PERFORMANCE
IS OUR GOAL**



PRE-SALES STAGE

- R&D product development (designs, tests, data collection, product books)
- Creating technical standards
- Application (layouts, calculations, technical support for proposals)
- Engineering cycles optimization
- Reverse engineering

PROJECT EXECUTION STAGE

- Designing (terminal points definition, risk analysis, calculations, FEM analysis, project layouts)
- Component definition (purchasing, calculations etc.)
- Auxiliary System incorporation
- Detailing (Production drawings)
- Kick-off / design approval meetings support
- In-house manufacturing supervision (deviations approval, internal tests)
- Factory Acceptance Test with customer participation



AT SITE PROJECT STAGE

- Commissioning at site
- Personnel trainings
- PM/TM start-up supervision

AFTER START-UP STAGE

- Post start-up assis (extended presence at site)
- PM/TM parameters optimization (performance tests)
- Troubleshooting (dynamic stability / vibration analysis & more)
- Technical advisory / audits





HYDRAULIC HEADBOX - AN ICONIC SOLUTION FOR YOUR ULTIMATE SUCCESS

Main features:

- **PONDSIDE:** Up to 10 m / 400 in
- **DESIGN SPEED:**
Up to 1500 mpm / 4920 fpm
- **BASIS WEIGHT:** 20 - 400 gsm /
12-250 lbs/3000ft²
- **TYPE:** Hydraulic
(with or without CP)
- **NO. OF CHANNELS:** 2-12
- **NO. OF LAYERS:**
Single or multilayer



BENEFITS:

- **IMPROVED PAPER QUALITY** (basis weight profile up to 80%, formation & fiber orientation - (+-) 5 degree)
- **IMPROVED PM UPTIME** (high internal- surface quality less cleaning operation & better runnability)
- **FLEXIBILITY OF PRODUCTION** (a wide range of adjustment)
- Link to **ANY QCS/DCS SOLUTION**

SAMPLE REFERENCES:

Customer: Smurfit Kappa Saillat, France			
Grades:	Two Ply Liner	Capacity:	620 t/d
Reel trim:	2700 mm / 354 in	Pondside width:	2950 mm / 116 in
Design speed:	1200 mpm / 3937 fpm	Number of channels:	4
Operating speed:	950 mpm / 3117 fpm	Number of layers:	Single
Basis weight:	120-220 gsm	Type:	Hydraulic

Customer: Confidential, USA			
Grades:	Saturating Kraft	Pondside width:	5842 mm / 230 in
Reel trim:	5626 mm / 221 i	Number of channels:	6
Design speed:	610 mpm / 2001 fpm	Number of layers:	Single
Operating speed:	486 mpm / 1594 fpm	Type:	Hydraulic
Basis weight:	150-300 gsm	Slice width:	5832 mm / 230 in
Capacity:	88 t/d		

Customer: Confidential, USA			
Grades:	Tissue	Capacity:	45 000 t/a
Reel trim:	5156 mm / 203 in	Pondside width:	5334 mm
Design speed:	1219 mpm / 3999 fpm	Number of channels:	8
Operating speed:	1200 mpm / 3937 inch	Type:	Hydraulic
Basis weight:	11-26 gsm	Number of layers:	4

Customer: Confidential, USA			
Grades:	Linerboard	Number of channels:	base - 8 top - 2
Reel trim:	8989 mm / 354 in	Number of layers:	Single
Design speed:	660 mpm / 2165 fpm	Type:	Hydraulic
Operating speed:	660 mpm / 2165 fpm	Slice width:	base - 9358 mm / 368 in top - 9417 mm / 371 in
Basis weight:	205-468 gsm		
Capacity:	410 t/d		
Pondside width:	base - 9347 mm / 368 in top - 9398 mm / 370 in		

Customer: Confidential, USA			
Grades:	Linerboard & Corrugated Medium	Number of channels:	base - 7 top - 2
Reel trim:	8763 mm / 345 in	Number of layers:	Single
Design speed:	1000 mpm / 3281 fpm	Type:	Hydraulic
Operating speed:	825 mpm / 2707 fpm	Slice width:	base - 9347 mm / 368 in top - 9398 mm / 370 in
Basis weight:	118-203 gsm		
Capacity:	130 t/d		
Pondside width:	base - 9347 mm 368 inch top - 9398 mm 370 inch		

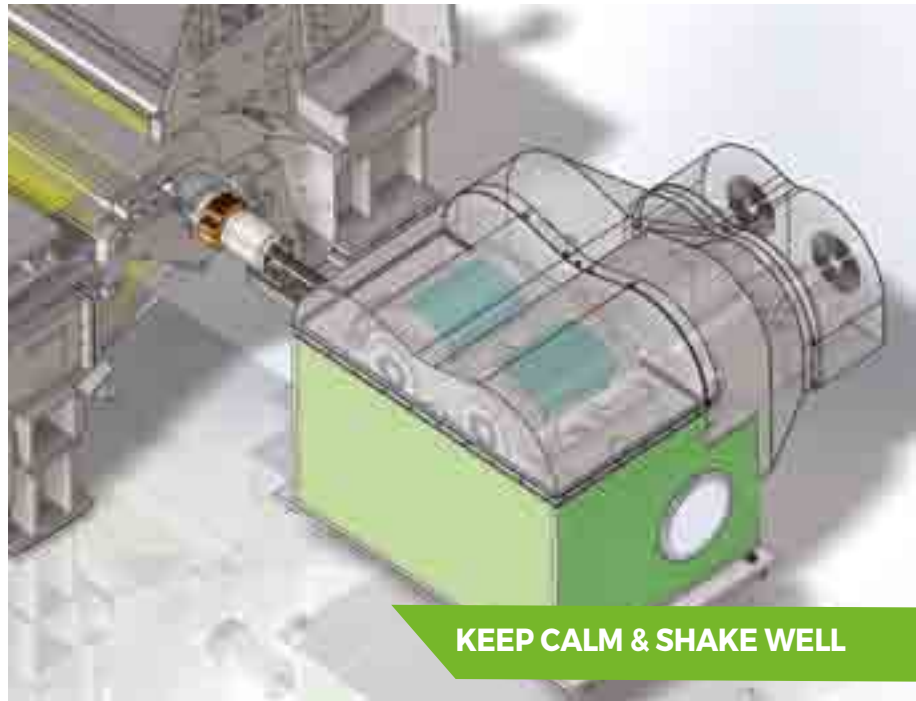


A wire shaking unit is a proven technology having superior impact on the web formation and final paper strength properties.

It improves paper quality through better formation and at the same time does not transmit any undesirable forces on foundation, headbox or any other machine sections improving PM performance.

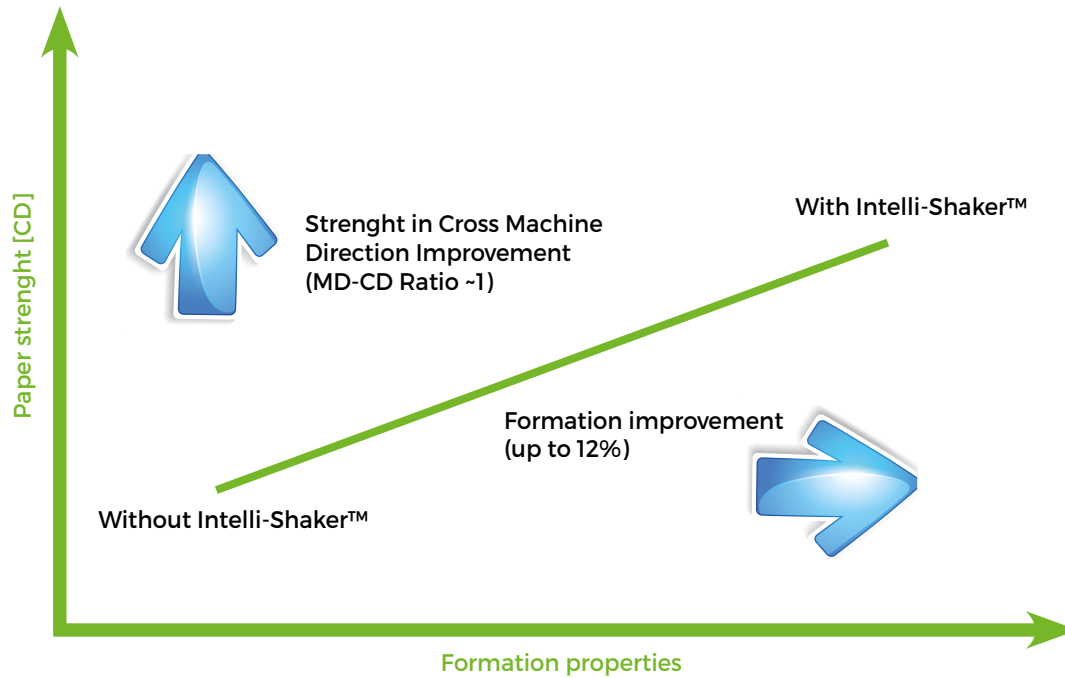
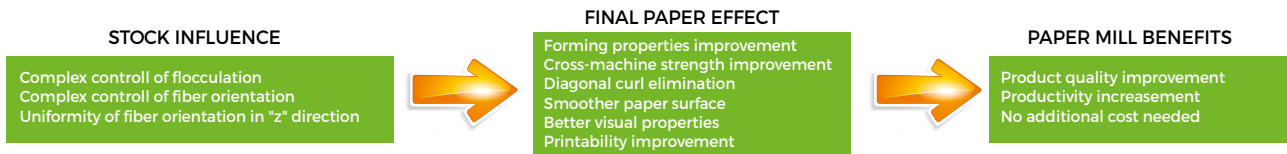
Product characteristics:

- **WORKING PRINCIPLE:** By the use of four rotating imbalanced masses Intelli-ShakerTM imposes the horizontal repeatable motion in the cross machine direction on the breast roll, while all vertical forces are being eliminated. The stroke and frequency is fully adjustable in the range of 0-25 mm and 1-10 Hz respectively.
- **LOCATION:** Attached to the Breast Roll on the Drive Side of PM
- **APPLICATION OPTIONS:** Fourdriniers & Hybrid Formers
- **WORKING CONDITIONS:**
0-25 mm
1-10 Hz (60-600 strokes/min)

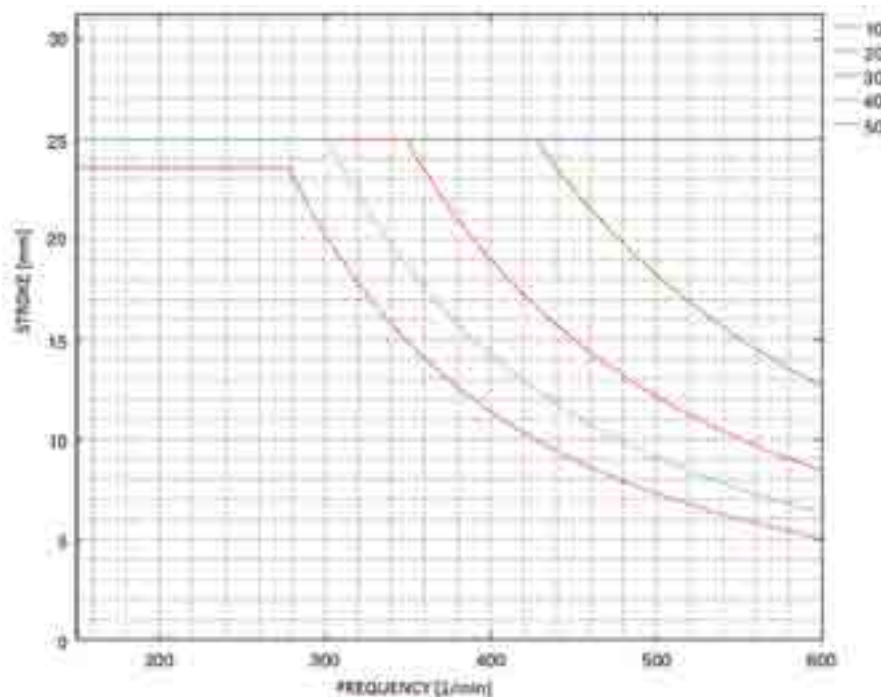


BENEFITS:

- **IMPROVES FORMATION UP TO 15%** - increased paper quality (MD/CD, SCT – for fluting)
- **Enables PM CAPACITY INCREASE** due to higher consistency in the headbox
- **HELPS TO IMPROVE PRODUCTION** in case of limited Chance of an outdated headbox exchance
- **Proper for ANY PAPER GRADES**



Every Shaking unit is indywidually designed depending on machine construction, breast roll mass and production type.



SHOE PRESS

- GENTLE TOUCH WITH EXTENSIVE IMPACT



Main Features:

- **PAPER WIDTH:** up to 10 m / 394 in
- **SHOE PRESS MODULE DIA:** 1300 mm / 51 in ; 1500 mm / 59 in
- **COUNTER ROLLS:** Plain, Intelli-DCRTM
- **CONFIGURATION:** Up-right, converted
- **NIP RANGE:** up to 1400 kN/m
- Compact design

BENEFITS:

- **LOWERING THE COST OF PRODUCTION** – 4-10% higher dryness – compared to previous technologies lower steam consumption
- **IMPROVED PAPER QUALITY** (increased stiffness & higher bulk)
 - brighter & stronger paper
- ECO friendly Concept (**LOWER STEAM CONSUMPTION**)
- Better PM runnability (**STRONGER SHEET** - less breaks & higher felt lifetime)
- **LONGER PRESS** felt life

SAMPLE REFERENCES:

Customer:	Smurfit Kappa, Papeles Cartones S.A		
Grades:	Liner and Corrugating Medium	Width of sheet:	3300 mm
Reel trim:	3500 mm / 138 in	Module size:	1300 mm
Max operating speed:	600 mpm / 1963 fpm	Mating roll:	1200 mm
Basis weight:	90-200 gsm	Nip load:	1st: 105 kN/m
Capacity:	120 000 t/a		2nd: 140 kN/m
			3rd: 1400 kN/m

Customer:	Confidential, North America		
Grades:	Multiwall Sack Kraft	Nip load:	1st: 70 kN/m
Max operating speed:	1007 mpm / 3300 fpm		2nd: 90 kN/m
Basis weight:	40-60 gsm		3rd: 1050 kN/m
Width of sheet:	4140 mm / 160 in		

Customer:	Jiangsu Changfeng Paper, China		
Grades:	Testliner	Module size:	1300 mm / 51 in
Reel trim:	4860 mm / 191 in	Mating roll:	Plain
Max operating speed:	850 mpm / 2789 fpm	Nip range:	1050 kN/m
Basis weight:	90-220 gsm	Nip load:	1050 kN/m
Width of sheet:	5000 mm / 197 in		

Customer:	Smurfit Cartón y Papel de México, S.A. de C.V. Molino, Los Reyes, México		
Grades:	Liner and Corrugating Medium	Width of sheet:	2550 mm / 99 in
Reel trim:	2410 mm / 95 in	Nip range:	1400 kN/m
Max operating speed:	800 mpm / 2625 fpm	Nip load:	1st: 100 kN/m
Basis weight:	100-240 gsm		2nd: 140 kN/m
Capacity:	170 000 t/a		3rd: 1000 kN/m

Customer:	Confidential, United Kingdom, Europe		
Grades:	Fluting, Testliner	Width of sheet:	5260 mm / 99 in
Reel trim:	5070 mm / 200 in	Module size:	1500 mm / 59 in
Max operating speed:	1200 mpm / 3937 fpm	Mating roll:	Inteli-DCR™
Basis weight:	80-120 gsm	Nip load:	1st: 80 kN/m
Capacity:	250 000 t/a		2nd: 140 kN/m
			3rd: 1400 kN/m



METERING SIZE PRESS STRONGER PAPER WEB & PERFECT PRINTABILITY



- **PAPER WIDTH:** Up to 10 m / 400 in
- **DESIGN SPEED:** Up to 1500 mpm / 4920 fpm
- **SIZING AGENT:** Starch, PVA, pigment
- **SOLIDS CONTENT:** Up to 18% (starch)
- **SURFACE SIZING WEIGHT:**
Up to 6 gsm / 1.2 lbs/3000ft²

BENEFITS:

- **IMPROVED SHEET QUALITY**- uniform starch application – higher sheet smoothness –better printability
- Increased in **WEB TENSILE STRENGTH**
- Easy maintenance – **HIGHER UPTIME** (a full cantilever design/efficient cleaning)
- **USER-FRIENDLY DESIGN** – easy to operate (automatic mode)
- The after Size Press - **DRYERS CAN BE REDUCED**
- **HIGH QUALITY** rods and holders
- **QUICK CHANGE ROLLS**



SAMPLE REFERENCES:

Customer:		Smurfit Cartón y Papel de México, S.A. de C.V. Molino, Los Reyes, Mexico	
Grades:	Liner and Corrugating Medium	Rolls OD:	1100 mm
Reel trim:	2410 mm / 95 in	Starch Weight Range:	5 – 8 g/m2
Max operating speed:	800 mpm / 2625 fpm	Starch Solids:	12,00%
Basis weight:	100-240 gsm	Starch temperature:	55-65°C (conventionally 60°C)
Capacity:	170 000 t/a	Design Nip:	60 kN/m

Customer:		SFT Aleksinskaya Paper and Board, Russia	
Grades:	Fluting, Testliner	Starch Weight Range:	3.5 g/m2
Reel trim:	4300 mm / 169 in	Starch Solids:	5-8%
Max operating speed:	865 mpm / 2838 fpm	Starch temperature:	70°C
Basis weight:	112-175 gsm	Design Nip:	50 kN/m
Capacity:	770 t/d	Operating Nip:	45 kN/m
Sheet Trim:	4300 mm / 169 in		

Customer:		Confidential, United Kingdom	
Grades:	Fluting, Testliner	Starch Weight Range:	3.5 – 7 g/m2 (total)
Reel trim:	5070 mm / 200 in	Starch Solids:	12-16%
Max operating speed:	1200 mpm / 3937 fpm	Starch temperature:	80°C (conventionally 60°C)
Basis weight:	80-120 gsm	Design Nip:	80 kN/m
Capacity:	250 000 t/a	Operating Nip:	60 kN/m

Customer:		Danyang Changfeng Paper, China	
Grades:	Testliner	Starch Weight Range:	3.5 – 7 g/m2 (total)
Reel trim:	4800 mm / 189 in	Starch Solids:	10-15%
Max operating speed:	850 mpm / 2789 fpm	Starch temperature:	80°C (conventionally 60°C)
Basis weight:	110-220 gsm	Design Nip:	50 kN/m
Capacity:	340 000 t/a	Operating Nip:	40-50 kN/m
Sheet Trim:	4800 mm / 189 in		

CAN A NEWSPRINT PM RISE FROM THE ASHES LIKE A PHOENIX?

- FORWARD-THINKING IDEAS ON HOW TO BUILD A PM FOR THE FUTURE

PHOENIX CONCEPT™

The new value for existing machinery

IN BRIEF

The global paper industry today looks much different than a decade ago. The constantly growing prices of media, salaries and raw materials are the main blocking factors for new investments. We need to adapt to daily challenges and simply act smarter than before to grow business. As Thomas Edison, a great inventor, said once "If there is a way to do it better... find it". The main idea is to share PMP's experience from the saturated European market regarding alternative PM rebuilds (the re-purposing of assets that are

no longer attractive – such as newsprint and fine paper machines or heavy containerboard grades). The talk will share an alternative investment strategy in papermaking machinery that is becoming more common in Europe and share hard facts and figures that will be useful to attendees when considering where to spend their capital dollars. In this business climate, there are many untapped resources available from the shutting down of PMs that can be re-located, refurbished and reconfigured to produce different paper grades that have growth potential. This talk will give examples of how other companies have navigated this strategy and have proven results. The PMP Phoenix Concept™ approach is one more step towards sustainability.

INTRODUCTION

Global market trends.

Before we start taking about the ideas how to build a PM for the future, close your eyes and go back for a moment to 1980s/1990s. Consumption of paper in all sectors (printing & writing, packaging and tissue) was very strong globally. This demand created many large new machine projects. PMs were getting bigger, faster and more technically advanced. All suppliers and paper producers were busy and happy. Lots of talented people were ready to support the P&P industry development. Global changes fueled the growth of P&P (more fast foods that needed boxes, more companies that needed paper to print documents and more conscious consumers who wanted to have better and better products – not grey but colorful). Ah! The good old days!

But as I believe everybody is aware nothing lasts forever. Global economy and political changes have resulted in a serious depression that hit our industry as well at the



beginning of 21st century. We could immediately observe less demand for paper and consequently new capital investments. Less projects available, resulted in couple of paper machinery builders bankruptcies including great Beloit Corporation. The impact of internet and social media totally changed the shape of printing & writing sector. Lots of assets have been closed. At the same time globalization and making the distances shorter have changed the way paper products are used and distributed. So are we really standing over the edge of a precipice? Well, surprisingly a depression is nothing new. Only in 20th century we could record at least 10 significant moments that, I believe made people think it was the end and they need to jump down the cliff. And what happened? Even though everything looked dark, gray and pessimistic – but yet PMP Group have survived out of the ashes of Beloit. The industry got sick but then got better. Died and then rose like a phoenix – stronger, smarter and different. Everything cooled down and stabilized. So I do believe we should expect a similar scenario. We will come out different, we will be forced to adapt to a new situation. However there is for sure hope for our industry.

In China people say crisis is also an opportunity. Today, tissue sector globally is relatively healthy and its increase corresponds with GDP growth. Containerboard producers fight with minimizing grammage range, maintaining at the same time product strength and production costs. Energy consumption is becoming crucial. So applying of highly advanced technological solutions such as multi-layer hydraulic headboxes, shoe presses or film sizers are getting more and more popular. The paper industry responded to the

**“IF THERE IS
A WAY TO DO IT
BETTER...
FIND IT”
THOMAS EDISON**

challenges by taking the opportunity to be more efficient. In case of newsprint & fine paper we observe a drastic fall in demand, one of the consequences of e-technology. There is an open question – what to do with the assets, in many cases, relatively in good condition? There is a new trend of reconfiguration/re-profiling of former newsprint PMs, especially observed in Europe, even including their relocation from one country to another. The investment strategy of paper companies has rapidly changed. Now, paper corporations as well as individual players are looking to spend as minimum as possible. As recent as 5 years ago there was still significant interest to buy huge new paper machines, which is not the case anymore. Today people are ready to accept higher risk and follow alternative investment paths – simply finding new business opportunities and focusing on PM rebuilds in different scenarios.

PHOENIX CONCEPT™ REBUILD DEFINITION

A decade ago, PM rebuilds were focused to change old, inefficient sections of PM/TM and apply brand-new technological units to reach higher capacity or better quality of the final product. Today this philosophy is not sufficient. We need to grab the hand of the change and move forward. Basing on our experience, we have extended the definition of PM rebuilds under the name Phoenix Concept™ on three levels: basic, advanced and premium. The basic level of the rebuild concept corresponds with the idea of the classical scenario from the past: exchanging the old section for a new one on existing PM. The advanced level of the concept, is logistically sophisticated, including PM/TM relocation – sometimes even from one country to another, and a production profile change i.e. newsprint into containerboard or heavy into lighter fluting/liner grades) and finally premium (including basic/advance levels of the rebuilds, plus products exclusively designed for a particular customer).

“Rising from the ashes like a Phoenix” - PM re-profiling ideas – a blend of core technological items and refurbished parts.

Imagine that you have a newsprint machine in hands which is an asset but not profitable any longer. Basically it has become a ball and chain, a problem that should be solved as fast as possible. So what options do you have? Let's think. Number one – close it and scrap it. Number two – sell it. Finally – number three – rebuild/re-profile it. I have been in this industry for 15 years and I have learned that papermakers are ambitious and proactive people. Basing on this fact I believe we can focus now on option number three – a newsprint machine re-profiling.



A smart manager should, at that stage, ask further questions: what type of machine I want to have? What are the market trends? How to design it using old newsprint asset and at the end – is it worth doing?

To better answer those questions let's use an example. I want to share our experience gained in Europe during similar project execution for a German customer in 2011, first of that type for PMP Group.

"EACH JOURNEY STARTS WITH A SINGLE STEP"

Our customer analyzed carefully market's expectations and defined an increased demand for paper products made of white top testliners (expected capacity: **300 000 t/a**). As the result the decision was made to

launch a new project. Goals were ambitious: reach production numbers and sophisticated paper quality parameters at the same time reducing investment cost significantly. The idea was to buy a newsprint machine and re-use it as the base of a reborn line. Due to the complexity of the project (disassembly, transfer of the machine, refurbishment of parts, engineering design and the construction of new sections, integration, installation, technological start-up and optimization) it was decided to look for a supplier with comprehensive project management skills. The fast production start-up was also a significant factor, thus keeping the deadlines and commitments were extremely important (13 months paper at reel).

The newsprint machine they targeted was found in Switzerland. The 212 inch (5400 mm) reel trim machine produced 128 000 t/a of 18 - lbs / 3000 ft² (30-55 gsm) paper at operating speeds of 3,940 fpm (1200 m/min) before it was idled. After transforming the machine to a new configuration the PM today produces **195,000 t/a** of white top testliner from recycled fiber with a basis weight range of 74-110 lbs / 3000 ft² (120-180 gsm) and an operating speed of 2,460-2,625 fpm (750-800 m/min), with a 210 inch (5350 mm) trim at the reel. This transformation included redesigning, disassembly, incorporating of core technological items, and full integration at the German mill.

Looking carefully at the entire process, the project was executed successively: on the one hand all work connected with an existing newsprint machine in Switzerland, on the other designing and manufacturing of a new equipment in our headquarters in Poland and finally full integration in the German mill. Disassembly of PM and elements

transportation from Switzerland to Poland took almost two months. During this time over **2300 t** steel of constructions was disassembled, packed on 170 trucks and send to our facility in Jelenia Gora, Poland. It was important to assess the condition of all elements and classify them based on three categories: approved, need to be refurbished or scraped. Simultaneously, new core technological units were designed using modern tools that enable creating models in three dimensions technology (SolidWorks). Visualizations improved complete understanding of the final solutions and allowed to introduce improvements during planning phase causing increasing user friendliness for machine staff.

Scope of supply covered the design and delivery of new key elements– such as an Intelli-Jet V[®] hydraulic headbox, top wire, 4th and 5th dryer groups, Intelli-Reel[®] and mechanical drives. It was also necessary to extend the existing bottom wire and the rebuild of the press section. For the factory acceptance test stage all elements (new and refurbished) were put together. The last stage – assembly and integration of all elements in the mill was executed by us in cooperation with a customer's project management team as well as external companies. Thanks to just-in-time philosophy and precise planning of storage capacity, the project was executed efficiently and on time.

The intention of that kind of projects are optimum costs of an investment that gives you a chance to obtain high effectiveness. Reborn machines are smart solutions, where technology is tailored made – key elements are new, less important parts - refurbished. Skills, team experience and technology allow to change a production profile of the machines.

When we move back to our questions: what type of machine I want to have? What are the market demands? How to design it using old newsprint asset and at the end – is it worth doing?

"WHAT TYPE OF MACHINE I WANT TO HAVE? WHAT ARE THE MARKET TRENDS? HOW TO DESIGN IT USING OLD NEWSPRINT ASSET AND AT THE END – IS IT WORTH DOING?"

First of all – it is relatively easy to re-profile a newsprint machine into fluting/liner one. There are basically three areas to pay attention to. Firstly – a wet end – as it is necessary at least to add one more layer of paper (so a hydraulic headbox and a top wire are essential). This allows to reach higher grammage range than in case of newsprint machines as well as to improve paper profile. Secondly – checking the expected dryness after press (as the web is thicker) – shoe press technology helps a lot in this case to significantly increase the dryness (**4-10%** more compared to previous technologies) resulting in steam consumption reduction as well as paper properties (bulk and stiffness). Finally, it might be reasonable to apply a size press (especially for lighter containerboard

grades) to increase paper properties. During re-designing process it is very important to make lines more energy efficient, more environmentally friendly and easier to operate and maintain. Flexibility, efficiency and adaptation to dynamic market trends become crucial.

Why containerboard sector? Based on market analysis the sector is ranked the second (after tissue) regarding its increase. The growth for packaging will continue smoothly with less consumption per capita through gsm decrease but more volume of products sold. E-commerce companies like Amazon or Alibaba will help to keep that trend. At the same time consumption will increase due to consumer sensitivity of sustainability issues and recognition of the renewable paper based products like bags and cups. It will be a great alternative to plastic.

The PM configuration has been already explained. Another alternative is to re-use heavy grades containerboard PMs and modify their profiles. Our recent experience in this field includes projects in UK (based on PM relocated from Italy), Poland, Russia (based on PM relocated from Scotland), China or Indonesia and so on. No doubt – the demand grows every year.

CONCLUSIONS

Now, we are coming to a fundamental question: how much money might be saved by choosing a newsprint machine re-profiling into a fluting/liner one? Let me first explain some industry standards. Based on know-how from experts, to get additional capacity after standard rebuild (including only new equipment) you need to invest around 700-800 USD per each ton of paper (including all possible work on the machine, auxiliary systems, civil works etc.). The investment per ton depends on the concept – it can be less it can be more.



In the discussed case, 300 000 t multiply 700 USD, means the theoretical investment should reach at the level of 240 mln USD. A new philosophy of the project helped to save almost **50%** of the investment which is a great achievement keeping in mind that we talk about mature, Western European market.

Is it possible to execute a similar project in America in the nearest

future? For sure – yes. There are assets that can be used. There are experts that can take care of execution. The concept is proven so I personally believe it is the matter to dare and act a little bit different than before. Well, it is fun, bringing lots of vivid energy. Let Confucius's words become a great inspiration for future projects "Each journey starts with a single step". ■



HOW TO EFFECTIVELY IMPROVE PAPER QUALITY?

- A MODERN HYDRAULIC HEADBOX AS A COST EFFECTIVE WAY TO ENHANCE PM PERFORMANCE

IN BRIEF

The Pulp & Paper industry is directly impacted by global megatrends nowadays. The papermakers responded pretty well to the business challenges by becoming more efficient. The use of highly advanced technological solutions such as multi-layer hydraulic headboxes, shoe presses and film sizers is getting to be more and more of a requirement. The main idea is to share with you PMP's global experience, connected with achieving premium paper properties while applying modern hydraulic headboxes. When papermakers look for opportunities to improve basis weight profile, sheet formation, fiber orientation, productivity improvement or better strength properties of paper, they are encouraged to take a closer look at the headbox currently installed on the paper-making line. Despite the fact that the headbox is only one piece at the beginning of the process but its impact on the whole project is significant.

“THE USE OF HIGHLY ADVANCED TECHNOLOGICAL SOLUTIONS SUCH AS MULTI-LAYER HYDRAULIC HEADBOXES, SHOE PRESSES AND FILM SIZERS IS GETTING TO BE MORE AND MORE OF A REQUIREMENT.”

GLOBAL MARKET TRENDS

Our industry is directly impacted by global megatrends. On the one hand, some of them like e-commerce development (more shopping on line and the need to protect the goods during transportation), fast-paced lifestyles (eating out, ready-to-cook products etc.), an increase in single person households (single portion packages), the aging of the population (higher demand for healthcare products) and higher sensitivity to sustainability (eco trend) fuel the growth. This is especially true for the tissue and containerboard sectors. On the other hand, as a consequence of digital media trends (e-technology), we have observed a drastic fall in the demand of newsprint & fine paper grades globally. In addition containerboard producers are forced to fight with reducing basis weight while still trying to maintain product strength and production costs. Energy consumption is becoming crucial. There is also more dynamic competition (imports of paper from low cost regions)

and more demanding retailer requirements, wanting to be able to pack more products on one pallet and make them stronger as transportation distances are becoming longer. Based on these trends the growth for packaging should continue smoothly. Perhaps we will see less consumption per capita due to basis weight reductions, however, we should also see more volume of product sold.

The paper industry has responded pretty well to the business challenges by becoming more efficient. The use of highly advanced technological solutions such as multi-layer hydraulic headboxes, shoe presses and film sizers is getting to be more and more of a requirement.

MARKET REQUIREMENTS WITH REFERENCE TO PAPER QUALITY

How are global market trends influence the development of paper machines? To help to illustrate this point, let's take three big countries with a range of customer demand: USA, China and Russia.

In the growing tissue sector, quality level is determined by local consumers. As you



may be well aware, when GDP growth and disposable income is observed, the demand for tissue is increasing in both volume and quality. Projects in this sector on emerging markets, are focused on replacing old machines by new ones (EcoEc type). This trend is especially observed in China and Russia. In more mature markets, such as the USA, most of the projects are focused on sophisticated rebuilds with installation of multilayer headboxes (2,3,4). In these markets, modern formers are already a standard, so the producers are focused on implementing highest product quality solution with an optimum web structure.

In graphic papers, demand has been decreasing in mature US and European markets. Papermakers there are more focused on cost optimization and PM runnability improvement. Many of them are looking for universal solutions, to produce paper suitable for both colour ink jet and colour laser jet printers (2 in 1 or dual purpose), a demand driven by today's office equipped with both types of printers. The demand is clear - to have repeatable performance (no jams in printers) and stable quality (excellent colour reproduction). The key for their success is to start with proper fiber orientation to avoid paper diagonal curl during the printing process. Excellent formation provided by a properly designed headbox will help greatly to reproduce consistent shape sharpness and brilliant colour. Rebuilds of graphic paper machines are applied within the wet end with a special attention to headboxes.

Unlike the maturing graphic paper, the containerboard sector has been developing and increasing step by step on all continents without exceptions. Basis weight of containerboard is decreasing from year to year by 1-2 gsm, especially in Western Europe and also in the USA. While this lower basis weight trend is observed, in many cases the expectations for the same or even higher sheet strength is expected. Fast Moving Consumer Goods (FMCG) producers push to optimize distribution and handling costs of ready-made products is a key driver for this trend. The whole supply chain must be optimized and the container box cost to performance ratio is their object of intense focus. The expectation is clear - the cost of packaging in the whole supply chain must be reduced (cost of the box, its efficiency to pack more in one common pallet, the max no of pallet per truck and disposable issues). Additionally, an attractive appearance of the box is now becoming more and more important as more and more boxes are used as shelf-ready display in retail stores. High quality of printability is critical to influence consumer's choice. For papermakers the challenges are clear: lower containerboard production costs, provide higher containerboard performance and improved printability.

In Europe, this trend is fueling the strong growth of Kraft Top liners. These containerboard grades are typically made with a duplex structure whereas the top is made with virgin Kraft fiber while the bottom is made with re-



cycled fiber. It offers to box converter a paper with the appearance of stronger Kraftliner grades but with a cost profile closer to Testliner. Higher printability on these new Kraft Top liner grades are typically made with hydraulic headboxes on a two layers Fourdriner machine, however, today even Gap forming is used more often. Common technology used is the hydraulic headboxes that offer superior sheet uniformity and formation - a critical element in the pursuit of better printability.

TIPS FOR A SUCCESSFUL REBUILD

It is important to understand the needs of your customers. There are a few important points to consider while considering a rebuild of a machine that involves a headbox.

First of all - it is critical to understand that a headbox is the beginning of the paper web forming process. If this step is done correctly, everything you do afterward (pressing, drying, sizing, calendaring etc.) is easier. In fact, reaching the high quality and productivity targets can only be possible with the highest quality hydraulic headboxes. Any compromises made at the beginning of the forming process will lead to other amplifications of defects requiring even more compensations. All these non-value added steps will ultimately drive up costs and lower productivity.

Problems, like poor sheet profiles from a headbox, will not only cause more paper rejects, it will also force you to slow down the line to dry up the moisture peaks. If there are web defects (stock lumps and edge defects) from the headbox, more web breaks will occur. An outdated headbox in poor technical

conditions may cause problems but you may not noticed it and you may be led to believe, over the years, that these symptoms are somehow normal and the problems are somewhere else. Our experiences all over the globe has shown us that every time we put strong focus on the wet section and when our headbox technology is involved in our projects, we achieve success stories quickly. Acting smarter rather than harder is the process of rebuilding the line.

Secondly, a headbox is not a screwdriver to be used for everything. In today's more demanding marketplace, a paper machine cannot be designed to produce, vastly different products - creating hybrid designs do not work well. A modern and efficient paper making line is designed and tuned to produce a relatively narrow range of products to avoid making compromises by trying to make grades at the far extremities of the spectrum.

Sometimes, when the solution is defined, we are requested to deliver a headbox proper for any scenarios. Precision calculations and proper design help to avoid troubles. We have proven in the past that we have the know-how and capability to tailor made a solution for any customer.

Coming now to the third point - a headbox is not a brick - it is a system. Before you decide to move forward with a papermaking machine rebuild for a new headbox, it is essential to analyze its application. Changing the headbox also requires modification of the stock approach system. Capacities of the fan pump, cleaners, screens and control systems, all need to be analyzed. The delivery of a sophisticated CP system and possible modification of a wire section must also be explored. However, it is very important to do things right. Our proposal always covers technical application analysis and indication of points that are essential to reach the goals. That is why headbox solutions are not delivered straight from a shelf. Each project, as well as a customer, is different and their needs are different. While having ambitious goals, professional execution is crucial to make returns on your investment efficiently and more quickly.

“MANY PEOPLE SAY THAT THE HEADBOX IS THE HEART OF A PAPER MACHINE. THE HEART IS THE ENGINE FOR OUR BODY AND SO IS THE HEADBOX FOR THE PAPERMAKING MACHINE.”

And finally, details matter. The devil always is in the details. Many people say that the headbox is the heart of a paper machine. The heart is the engine for our body and so is

the headbox for the papermaking machine. It should be in a good condition, and kept clean. Headboxes can last a long time. Every headbox is like a unique luxury item, it is custom, tailor made solutions, produced by us from A to Z, under full in-house control, at our headquarters in Poland. We apply modern manufacturing technologies, including laser welding and other automated steps. Our policy is based on continuous quality control. Surface flatness measurements by using a Faro Arm device. Once surface polishing is completed, the results are a mirror finish. Many critical part are hand- made and custom fitted by our specialists. For us, the use of manufacturing methods according to highest world standards to ensure excellent headbox performance and low maintenance costs is just what we do very well daily.

EXPERIENCE THAT COUNTS

Our experience has been collected on 6 continents on both well-developed and emerging markets, in paper mills that produce almost all grades, including tissue, packaging, fine and specialty papers.

There are over **130** PMP Intelli-Jet V® hydraulic headboxes working around the globe. Our solution is patented design. Among our customers today you may find market leaders as well as other individual producers. We deliver hydraulic headbox with or without CP to machines of any type, up to 395 inch width, from 2 - 12 channels and working speed of up to maximum 6900 fpm.

Complex control of the headbox process, from the concept, through the design, manufacturing, quality control up to optimization, have been our core expertise in providing optimum solutions to papermakers. It is something we do very well. For over **160** years of activity, almost **760** headboxes of different technology have been built in our factory in Jelenia Góra, Poland, including rectifier roll headboxes, as well as hydraulic ones. Since 1990 our company was a part of Beloit Corporation and was named the Centre of Excellence for producing hydraulic headboxes. This tradition continues today.

In USA, we have been active for half a decade and established strong ties there. Until now we have been working with market leaders in both paper, packaging and tissue sectors.

CASE STUDIES

To better illustrate all the points above, below you will find two examples of such projects completed by PMP in US market.



Case study number 1 is a paper machine line wet end rebuild for a leading paper producer in US producing twin ply linerboard and corrugated medium.

The main goals of the rebuild were: to improve paper quality (dealing with a poor CD profile), to take care of layers' purity and to allow production a relatively thin top layer.

The scope of the delivery executed by us covered two hydraulic headboxes (primary and secondary), a Consistency Profiling System for the primary headbox, essential wire section modifications as well as pre-assembly, erection supervision and start-up services. The customer took care of the stock approach system for both units.

Both headboxes were designed and calculated carefully to meet specified basis weight splits between the top and bottom plies. There were several challenges at the beginning of the project. From the design perspective, taking into consideration an extreme pondside width (close to **350** inch), two factors were critical: understanding the process of papermaking and to compensate the deflections properly. As a company we have a rich experience in deliveries of that type of units including both primary and secondary positions. To make sure the deflection would be compensated well, we followed a tailored-made designing path exceeding the scope of thermal and hydraulic calculations. Our customer is very demanding and conscious, so each stage is always thoroughly checked. To achieve a proper quality of the top ply and ensure proper layer purity, the equipment was designed to minimize the jet impingement angle from the secondary headbox. Our solution ensured a production of pure, thin top layer as it was required. In addition, it is worth to mention that the logistic of the project was demanding as each headboxes' weight exceeded 44 tn, however erection and start-up process were completed within 19 days. As a result of the rebuild paper quality was

improved significantly (CD 2 sigma less than 0.6%) and expected layer purity was achieved. This case helped us to obtain a similar applications for the same customer in US, that confirms the delivered solution fully met the user's expectations.

The second case study is a fourdrinier tissue machine wet end rebuild scenario for a tissue producer in US. The discussed tissue machine of reel trim **200** inch produces tissue with basis weight range 10-30 lbs / 3000 ft² and working speed from 2700 to 4650 fpm. As the old headbox was outdated and not flexible enough, a main goal of the project was to ensure higher flexibility of production through applying of 4-layer type hydraulic headbox roof type and to meet the deadline (paper at reel within 9 months). This concept is innovative in the tissue industry as the most common solutions are single and from time to time double layer headboxes. The idea was to play with different mix of stock to produce products with varying layer compositions. As you may imagine this 8 channel, 66 tn unit is sophisticated and very complex.

“EVERY PMP’S HEADBOX IS LIKE A UNIQUE LUXURY ITEM, IT IS CUSTOM, TAILOR MADE SOLUTIONS, PRODUCED BY US FROM A TO Z, UNDER FULL IN-HOUSE CONTROL, AT OUR HEADQUARTERS IN POLAND.”

Taking care of proper calculations, applying of high quality materials and a logistics process were crucial. As a curiosity, during installation at site we had to rotate and lift the headbox using special helping tools. The main project goal – production flexibility increase was met followed by improved tissue properties (**CD 2 sigma COV – 2%**) immediately after start-up.

CONCLUSIONS:

To sum up. When you look for opportunities to improve basis weight profile, sheet formation, fiber orientation, productivity improvement or better strength properties of paper properties, take a closer look at your current headbox. Despite the fact that the headbox is only one piece at the beginning of the process but its impact on the whole project is significant.

Personally, I would like to encourage you to meet experts, who, I am sure, can help you to choose the best way for your success. You are warmly invited to Jelenia Góra to witness headboxes’ designing and manufacturing process anytime. As an alternative, as PMP, we offer also mill audits and technical discussions for whom may be interested.

Maja Mejsner
Director Business
Development & Marketing PMP
(Paper Machinery Producer)



HOW TO ACHIEVE UP TO **20%** HIGHER TISSUE PRODUCTION FLEXIBILITY AT LOWER CAPITAL INVESTMENT COSTS? - INTELLI-TISSUE® INTEGRATED TISSUE MILL CONCEPT



Learn more about:

- PMP & YFY – 20 years partnership
- **(7)** Intelli-Tissue® 1600 in YFY's fleet adding **300 000 t/a** of high quality tissue – where, when, why?
- Intelli-Tissue® Integrated Tissue Mill Concept – a production flexibility, significant reduction of capital investment costs, shortening of delivery time (up to **15%**)
- Crescent-Former proven technology – impressive efficiency (uptime **96%**) and user-friendliness (4 operators to run 2 lines)

PMP-YFY PARTNERSHIP IN BRIEF

PMP (Paper Machinery Producer) has been supporting one of the leading Asian papermakers – Yuen Foong Yu Corporation for the last **20 years**, executing projects both in the tissue and paper field.

At present, in the tissue area, YFY owns **(7)** PMP Intelli-Tissue® 1600 lines – all are installed in Mainland China: in Beijing, Yangzhou and Dingfung, reaching total capacity of **300 000 t/a**. 1st Crescent-Former Intelli-Tissue® machine (2.4 m wide) was launched in 2008 in Beijing, China. Excellent results of this project have encouraged YFY to continue partnership with PMP.

2nd and 3rd (PM#5 & PM#6) 2.8 m wide Crescent-Former Intelli-Tissue® were started-up in 2012 in Yangzhou, China. YFY Management Board found out this start-up as the quickest in YFY's history!

After successful start-ups in Beijing and Yangzhou mills, in spring 2013, PMP has been chosen again to support YFY's development, this time adding **(4)** more tissue making lines.

At the end of March 2013, YFY officially announced a massive expansion plan which included investing over 260 mln US dollars in Taiwanese and Chinese plants. At the same time PMP has been awarded a project for **(4)** new complete Crescent-Former Intelli-Tissue® 1600 machines built based on Intelli-Tissue® Integrated Tissue Mill Concept (2 TM's in one building without a basement, with a common control room & replacement parts base). On 3rd July 2014 (PM#7) and on 28th August 2014 (PM#8) in Yangzhou, China, 4th and 5th machine fully designed and produced by PMP started-up easily. Then, on 8th December 2015 (TM#1) and on 14th January 2016 (TM#2) in Dingfung, China, 6th and 7th machine were successfully brought on stream bringing all involved satisfaction & pride.

CASE STUDY:
(7) INTELLI-TISSUE®
1600 LINES FOR YFY
(YUEN FOONG YU),
CHINA, BRINGING
300 000 T/A
OF HIGH
QUALITY TISSUE



“PMP HAS BEEN SUPPORTING ONE OF THE LEADING ASIAN PAPERMAKERS – YUEN FOONG YU CORPORATION FOR THE LAST 20 YEARS, EXECUTING PROJECTS BOTH IN THE TISSUE AND PAPER FIELD.”

INTEGRATED TISSUE MILL CONCEPT – HIGHER PRODUCTION FLEXIBILITY, LOWER CAPITAL INVESTMENT COSTS, SHORTER DELIVERY TIME

To optimize the investment, YFY decided to follow the scenario from 2012 (PM#5 & PM#6 Yangzhou project) and clone the same concept for an Integrated Tissue Mill: two tissue machines with rewinders, with a common control room in the same building, as well as a warehouse and converting area. The concept of the Intelli-Tissue® Integrated Tissue Mill was implemented both in Yangzhou mill (PM#7 & PM#8) and in Ding-fung mill (TM#1 & TM#2) ensuring staff & space optimization, high production flexibility and a significant operation cost reduction.

TECHNOLOGY THAT COUNTS – COMPACT DESIGN & USER-FRIENDLINESS

Recent **(2)** tissue machines are 2.8 (110 inch) reel trim Crescent-Former type tissue machines with an operating speed of 1,600 mpm (5,250 fpm) and daily capacity of 80 tpd each. Machines are producing virgin fiber-based tissue in the basis weight range at the reel from 13 to 31.3 gsm (8-19.1 lbs/3000 ft²) for conversion into facial tissue, toilet rolls and kitchen towels.

The Yangzhou project (PM#7 & PM#8) was split between YFY and PMP. PMP took care of the stock prep-



aration lines (common system for short and long fibres), stock approach lines, both tissue machines including auxiliary systems like mechanical drives, oil lubrication, steam & condensate, dust control, machine controls and instrumentation, as well as shaft pullers. YFY was responsible for the building, rewinders, QCS & DCS and electrical drives. As for machine configuration each was equipped with: hi-tech Intelli-Jet V[®] hydraulic headbox, (4) roll Intelli-Former[®] Crescent-Former, a single nip Intelli-Press[®] with large **41** in dia suction press roll for higher bulk, a **16** ft steel Yankee Dryer and steam-heated hood system (as natural gas is not available in mill location) and an Intelli-Reel[®].

Both machines are almost identical with the exception of the headbox technology that is double layer on PM#8 (and consequently the stock prep and stock approach are more advanced) – to increase production flexibility.

COMPARING TO A SINGLE MACHINE CONCEPT, BOTH PROJECTS GOALS ENSURED:

- INVESTMENT COSTS REDUCTION (UP TO **20%**),
- REACHING HIGH PRODUCTION FLEXIBILITY AND HIGH RUNNABILITY LEVEL (UPTIME UP TO **96%**),
- REDUCTION OF THE STAFF NEEDED TO OPERATE THE MACHINES (4 OPERATORS PER 2 LINES),
- SIGNIFICANT REDUCTION OF PRODUCTION COSTS (2 IN 1 CONCEPT),
- OPTIMIZATION OF THE SPARE PARTS BASE (1 BASE PER 2 LINES),
- OPTIMIZATION OF THE STORAGE SPACE.





neously up to the pre-erection phase taking advantage of our two facilities: PMPoland (Poland) and PMP IB (China). The entire engineering project as well as crucial systems like hydraulic headboxes, SPRs, YDs and hood systems were designed and made in Europe. Other parts including complete forming section, press section structure and a reel where built in China. Both machines were fully pre-erected at our Chinese facility in Changzhou and fully tested. After the factory acceptance test they were sent to the mill. A short distance between the fa-

cilities (2 hour drive) allowed easy access to resources in case of emergencies. The PM#7 erection at site started in March 2014. Then two months later the PM#8 foundation was ready. As a result, the TMs were put on stream one after another: PM#7 in July and PM#8 at the end of August last year - four months (from base plates up to paper at reel) for each machine. It is worth mention that the saleable paper was reached almost right-away after the start-ups of both machines. It is very important because if case of ineffective start-ups, each lost hour generates losses.

EXCELLENT RESULTS MATTER – A BLEND OF ENERGY SAVINGS & PREMIUM QUALITY

The main technological goals were focused on energy savings, premium quality of the final product and production flexibility. Attractive media consumption levels per ton of paper: steam 2.7 T, water up to 7 m³ and electricity up to 619 kWh. Premium quality of the final product is confirmed by the following figures: MD/CD – 1:1.5 – 1:3, moisture profile: 2σ less than **1%**, CD basis weight profile: 2σ cov less than **2%**.

TASK MANAGEMENT – SIMULTANEOUS EXECUTION TO SHORTEN DELIVERY TIME

The project for PM#7 and PM#8 for YFY Yangzhou was launched in April 2013 and both TMs were executed simulta-

INTELLI-TISSUE® INTEGRATED TISSUE MILL CONCEPT – BENEFITS

What benefits YFY got when investing in Intelli-Tissue® Integrated Tissue Mill Concept? Having two TMs under one roof?

“WHAT BENEFITS
YFY GOT WHEN
INVESTING IN
INTELLI-TISSUE®
INTEGRATED
TISSUE MILL
CONCEPT?”



Benefit #1 – much higher **FLEXIBILITY** of production lines. For the product: they can play more with production options and reduce the necessity of frequent TM adjustment for grades. As a result, better annual TM efficiency is reached. YFY today can set each machine for a different product. At the same time, the number of staff can be reduced as the machines are identical and smart maintenance solutions are applied. Only 4 operators run both machines.

Benefit #2 - YFY saved money on **CAPITAL INVESTMENT COST**. The building has been optimized and well-arranged with a smaller footprint than (2) independent machine rooms. In Yangzhou the building is simplified – with no basement – only pits for the fan pump and UTM pulpers which helped to save **20-30%** of the civil cost when compared to a building with a basement. Crescent former machines are compact (10% shorter in length) when compared to other types of machines on the market. The cost of the equipment has been reduced through designing and applying common systems for both lines (**2 for 1**) and minimize spares between the two machines.

Benefit #3 - Executing two TMs at the same time was **SHORTENING OF THE DELIVERY TIME** due to optimized execution cycles – approx. **10** months ready for shipment. As components are interchangeable between the machines the YFY staff has had a chance to get familiar with equipment faster and save costs on replacement parts.

ADDED VALUE FOR THE FUTURE – SMOOTH OPERATION & HIGH QUALITY TISSUE

The machines run smoothly and efficiently and are great tools to produce high quality tissue made of virgin fibres



reaching production goals (**160 t/d** in total). They are flexible as they are based on proven Crescent Former technology (the leading concept worldwide for tissue production). The mill has gone through production trials reaching from time to time the operation speed on machines: 5580 fpm (**1700 m/min**) and a result increasing daily production capacity by **25%** (from 160 – 200 t/d on both machines). The machine design is modern and compact and as a result, downtime can be reduced to a minimum (estimated: **12** days a year – a number already achieved on machines PM#5 and PM#6). Operators appreciate smart and user-friendly solutions that support efficient clothing changes (change time: for wire – one hour, for felt - up to two hours). 2 people are enough to run the entire line from stock-prep up to the rewinder. Machines are definitely eco-friendly which is confirmed by low media consumption.

Maja Mejsner
PMP Business Development & Marketing Director





NETWORKING OPPORTUNITIES



ASPI SPRING MEETING, USA



CIDPEX, CHINA



PAPERCON, USA



MIAC, ITALY



ASPI FALL MEETING, USA



PAP-FOR, RUSSIA



PMP Intelli-Tissue® 3D Model in a Chinese Papermaking Museum!

Hebei Jinboshi Group Co., Ltd is a professional tissue-making enterprise, located in Baoding, Hebei Province (established in July 2000). Jinboshi Group produces high-quality toilet paper, facial paper, napkin and wetnaps under brand "Golden doctor", "Qinqin jia ren".

Company decided to open a mu-

seum dedicated to Paper Industry and awarded PMP to prepare a 3D model of Intelli-Tissue®. It is a result of great partnership that started this year after signing contract for (2) Intelli-Tissue® 1200 EcoEc lines. PMP is proud to be part of this project.

3D model of Intelli-Tissue® machine will be one of exhibits in the Paper-making Museum in Hebei Jinboshi Museum. Museum will start its activity by the end of May 2016.

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