



PRESSBOOK

EDITION 9

WeTech **Care**

 **TOSCOTEC**
A Voith Company

PRESS BOOK

EDITION 9

Dear Customers,
this new Press Book edition presents an overview of Toscotec's achievements in 2023.

The spirit that drives our brand is the partnership we establish with our customers. Your requirements, targets and ambitions design our strategy. Toscotec is focused on the technological progress that will enable the decarbonization of the paper industry.

As we continue to raise the standards of technology in the tissue industry, we thank you for your trust.



Alessandro Mennucci
Chief Executive Officer of Toscotec



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Customer testimonials

What customers say about Toscotec is our best presentation.

Here are their testimonials from the past year.



ABOUT ENERGY EFFICIENCY AND SUSTAINABLE PAPERMAKING

GRANDBAY PAPELERA INTERNACIONAL, GUATEMALA

Alberto Matos, Project Engineering Manager

"This is the first tissue line supplied by Toscotec that we have installed, and we are very satisfied with the project outcome. The cooperation with Toscotec was very positive throughout the entire project. The start-up went very smoothly, and the machine is producing high quality tissue. We expect it to quickly achieve good runnability and high energy efficiency."

SOFTYS, MÉXICO

Pedro Urrechaga, Managing Director of Softys subsidiary in México

"We pursue our strategic growth in the Mexican market with a focus on the efficiency of our operations. With a clear view of our future, we selected Toscotec for the supply of a state-of-the-art, energy efficient tissue line, in order to support our target of generating sustainable value for all."

WEPA, FRANCE

Aurelien Lebas, Technical Project Manager

"The installation of this TT SYD is aimed at reducing our energy consumption and overall carbon footprint, in line with our strong commitment to resource efficiency. It will also increase reliability and operational safety at our facility. Based on our long experience working with Toscotec, we expect to exceed our targets."

JUMBO CENTRE, SOUTH AFRICA

Sean Nieuwenhuys, Chief Operating Officer

"I have been acquainted with Toscotec for several years and been involved in the start-up of three tissue machines with Toscotec as the key technology provider and partner. Toscotec is known for fulfilling its technological commitments and helping clients achieve its efficiency and quality goals. I am confident that with this latest project, our business will reap the benefits of numerous technological advancements and improved energy efficiency. We anticipate that the new generation shoe press will enhance the bulk and softness of our products and improve the overall efficiency in our converting operations."

SAUDI PAPER GROUP, SAUDI ARABIA

Mohamed Abdelghaffar, Operations Director

"We are very pleased with this successful start-up, and with Toscotec's ability to manage the entire project with flexibility and competence. We expect to quickly achieve excellent performances on PM2 both for tissue quality and production efficiency. SPG's project team is already working with Toscotec on the engineering phase of PM5, our new, double-width AHEAD tissue line. We are happy to continue this partnership, taking together another important step in our growth strategy."

BIORIGIN SPECIALTY PRODUCTS, USA

Steve Michalko, Vice President Technical Service

"The entire project went smoothly from inception to successful completion without any significant concerns. The start-up curve was literally hours, and we continue to see intended and unanticipated improvements. The solutions provided by Toscotec have eliminated previous operational constraints and positioned BiOrigin Specialty Products to improve both capability and productivity moving forward."

SHAWANO SPECIALTY PAPERS (LITTLE RAPIDS CORPORATION), USA

Michael Bogenschutz, Vice President and General Manager

"Toscotec provided excellent technical support throughout the entire project. Start-up of the new Yankee went smoothly, and the dryer is performing well. We are experiencing lower energy consumption and are seeing the potential for increased production efficiency."

ABOUT PAPER QUALITY

EUROPAP TEZOL KAĞIT, TURKEY

Ahmet Şenyavaş, Factories Director

"The cooperation with Toscotec during the entire project was very positive. We are confident that this state-of-the-art tissue line will allow us to meet the high quality standards of our customer base, especially in terms of the softness and hand feel of our super-prime brands."

JUTHOR PAPER MANUFACTURING (MEPCO GROUP), SAUDI ARABIA

Adel Alfar, Operations Director

"Our partnership with Toscotec has been marvellously successful. Even though we faced some challenges during the pandemic, we have successfully managed to deliver the test run and the commercial launch according to the scheduled timeline very smoothly and efficiently, producing premium quality tissue products."

CARTIERE DI GUARCINO, ITALY

Simone Principia, Plant Manager

"Thanks to the good teamwork between Toscotec, Voith and CDG technicians, the start-up went very smoothly, and we continue to see performance improvements even beyond our expectations. The fully tailor-made technological solutions provided by Toscotec have increased PM2's production and set a higher standard of quality, which is key for our customers."

GULF PAPER MANUFACTURING, KUWAIT

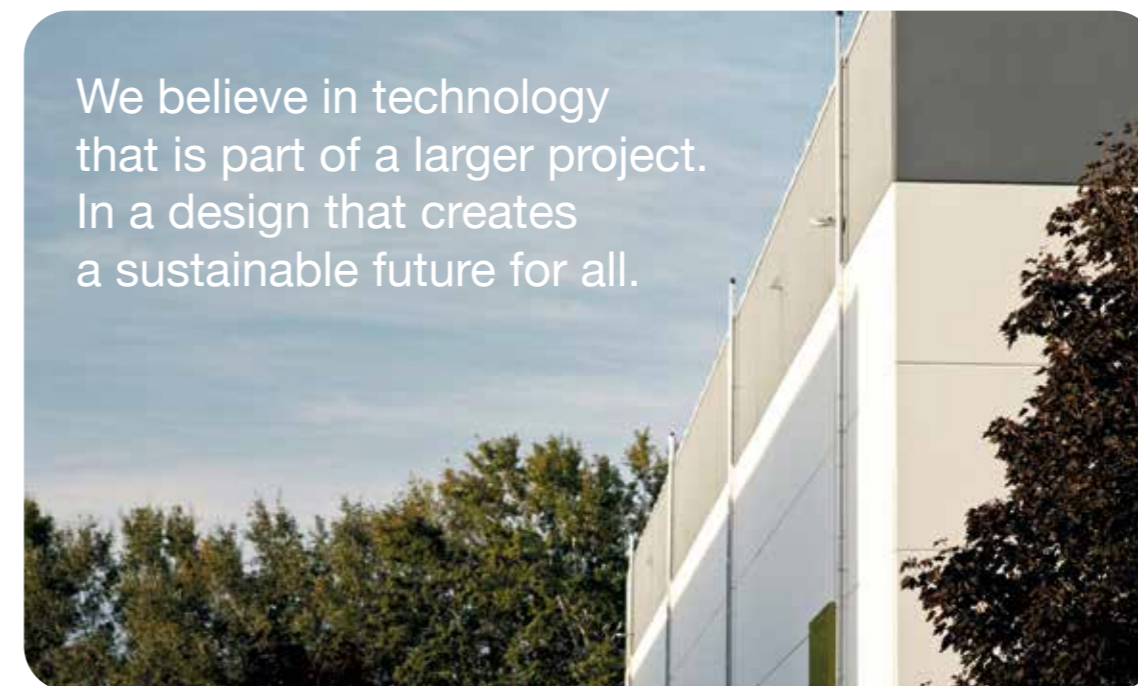
Ghaleb Alhadhrami, Projects & Development Manager

"With Toscotec's rebuild of our packaging paper machine in 2019, we achieved a substantial production increase, reduced sheet breaks by over 80%, and improved paper quality especially in the moisture profile and hand feel. We are confident that Toscotec will deliver on this new upgrade of our tissue machine as successfully as they did two years ago. This new headbox and approach flow system are also fit for a future rebuild into crescent former configuration."

CARTIERA PIRINOLI, ITALY

Silvano Carletto, President

"The successful completion of this machine upgrade allows us to cut PM1's consumptions and achieve higher flexibility in the operation of the press section. We especially appreciated the fact that we could find the correct settings of the machine immediately after start-up, almost effortlessly. Toscotec accompanied us throughout this strategic project with high expertise, competence and reliability."





Turnkey projects highlights

30

IN TOTAL

More than 30 turnkey projects to date.

25

SINCE 2015

More than 25 turnkey projects since 2015.

7

IN 2023

In 2023: 7 turnkey projects in progress.



Toscotec to supply a turnkey tissue line to GrandBay Papeles Nacionales in Colombia

GrandBay Papeles Nacionales has selected Toscotec for the turnkey supply of a new AHEAD 2.2 tissue line (PM5) at its Pereira production base in Colombia. This is Toscotec's second project with GrandBay who is currently installing a complete AHEAD 2.2L tissue line at GrandBay Papelera Internacional in Guatemala. The new PM5 in Colombia is scheduled to start up in 2024.

The AHEAD 2.2 machine has a sheet trim width of 3,600 mm, a design speed of 2,200 m/min and an annual production capacity of over 40,000 tons.

Designed to deliver the highest drying efficiency with the lowest possible energy usage, it features TT NextPress latest shoe press generation, a third-generation design TT SYD Steel Yankee Dryer with patented heads insulation system, and high efficiency TT Hood.

The turnkey supply includes the complete stock preparation system, Toscotec's patented TT SAF® DD (Short Approach Flow system with Double Dilution), fiber recovery

and water clarification systems, the complete tissue line with electrification and controls, as well as dust and mist removal systems. A full service package complements the turnkey scope with erection and supervision, training, commissioning, and start-up assistance.

Cesar Solano, Chief Executive Officer of GrandBay Group, says, "Continuing to grow with the market, satisfying the needs of the consumers with products of the best quality and accompanying the growth of our clients are guiding principles of our vision, which are supported by investment in the best technology."

Alexander Schuler, Chief Operation Officer of GrandBay Group, says, "We selected Toscotec for this important project in Pereira, because we have seen firsthand their ability to manage complex projects in Latin America. The turnkey supply gives us the highest performance guarantees for success."

Gabriele Romanini, Toscotec Sales Manager, says, "The configuration of Papeles Nacionales' new line is state-of-the-art. It features Toscotec's first-in-class energy efficient technology including the winning combination of our upgraded TT NextPress shoe press technology and Steel Yankee."



Joining forces: Optimized stock preparation portfolio from Voith and Toscotec for tissue production

- Based on the joint know-how of Voith and Toscotec, solutions adapted specifically for the tissue sector are newly developed
- The new stock preparation systems are already implemented in more than 10 new plants with over 70 installed machines
- Among others, the customer Vajda-Papír benefits from the innovative solutions, which went into operation there successfully

Lucca. For more than two years now, Toscotec has been a subsidiary of Voith and since then has been serving the business with new lines and major rebuilds in the tissue paper sector for

the entire Voith Group. As a result, intensive cooperation began, which among other things resulted in an optimized BlueLine stock preparation portfolio for the tissue sector. The optimized portfolio is convincing, with more than 10 stock preparation systems for the tissue sector ordered worldwide in the last two years and with some already in operation. Voith has delivered over 70 machines, and many more are currently being processed.

"The cooperation between Voith and Toscotec has paid off for our customers right from the start," explains **Steffen Bassmann, Director Product Management Fiber Systems at Voith Paper**. "I am impressed how well Toscotec and Voith harmonized in their

cooperation from the very beginning. This is a real win-win situation with clear added value for tissue producers worldwide."

"Together, we can offer our customers the best possible technologies for the entire process chain," adds **Elisa Bertolucci, Fiber Systems Engineering Manager at Toscotec**. "Our experts are always on hand to provide advice and support in achieving individual goals. Best-in-class technologies ensure highly efficient stock preparation and optimize resource efficiency."

As a leading tissue solutions provider, Toscotec can draw on Voith's full stock preparation expertise. For optimized water and wastewater management, Voith and Toscotec also work together with Meri, another Voith subsidiary. Customers thus benefit from a full-line portfolio from one source.

One system already successfully commissioned is that of Vajda-Papír at its plant in Dunaföldvár, Hungary. Toscotec's AHEAD 2.2L machine has a production capacity of over 80,000 tons/year with a paper width of 5,600 mm and a maximum operating speed of 2,200 m/min. Here, the turn-key delivery includes the complete stock preparation system with new solutions

from the harmonized Voith-Toscotec portfolio. These comprise IntensaMaXX, IntensaScreen, TwinFlo Refiner, a deflaker and a jointly developed thick stock cleaner (IDH). A new HC pulper designed by Toscotec and based on Voith's many years of pulping experience is also used. Furthermore, a new TT Hydromix was installed, which was jointly developed by Voith and Toscotec. The latter led to remarkable achievements on MD basis weight profile.

In addition to the stock preparation portfolio for tissue production, the cooperation extends to many other important areas such as paper machine components. Toscotec and Voith also complement each other in service and in the supply of spare and wear parts for tissue production. Last but not least, there are ideal synergies in the areas of engineering, automation and supply chain.



Toscotec to supply a complete press section rebuild to Cartiera Pirinoli in Italy

Italian carton board manufacturer Cartiera Pirinoli selected Toscotec for the rebuild of the entire press section of PM1 at its Roccavione site in Northern Italy. The project is planned for the second half of 2023.

In order to ensure the highest operation flexibility across a wide range of basis weights, Toscotec will supply both a first nip composed of an upper plain press and a lower suction press, and a second nip featuring Voith NipcoFlex shoe press designed for a maximum nip load of 1,600 kN/m. The scope also includes a fully automatic tail feeding system, felt runs, showers, rolls, doctors, as well as guide and stretcher systems.

The rebuild is set to significantly increase PM1's productivity. The replacement of lower efficiency press rolls with a high performance first nip and a NipcoFlex will ensure a drastic reduction of PM1's energy consumptions and paper breaks and increase post-press dryness.

Silvano Carletto, President of Cartiera Pirinoli, says, "Toscotec's technological solution offered a two-fold advantage: an optimal flexibility of regulation on the shoe press and an efficient layout inclusive of automatic tail feeding system. We are happy to partner with an established Italian supplier."



Enrico Fazio, Sales Director of Toscotec's Paper & Board division, says, "We are proud to provide an important rebuild to Cartiera Pirinoli, whose workers are entrepreneurs with full decision-making power. Their key concern was the supplier's reliability and capacity to deliver an actual production

upgrade. I am confident that this technological solution will allow them to achieve both higher efficiency and quality, especially in terms of paper bulk. In the future, Toscotec will continue to provide onsite and remote expert services for all their needs."

Toscotec to supply a complete packaging paper machine to Indevco Group in Greece



Unipakhellas, a member of Indevco Group, contracted with Toscotec for the supply of a complete paper production line to be installed at Unipakhellas Central (UHC) mill in Pelasgia, region of Fthiotida, Greece. Unipakhellas aims to produce high quality test liner and fluting grades to Greek and export markets. The paper machine is scheduled to start up soon.

Toscotec has been selected as the main machinery supplier due to its proven engineering capabilities and history of successfully managing complex installation and start-up projects. Indevco, through its engineering company Phoenix, will realize all the auxiliary plants.

The new machine has a wire width of 3,000 mm and will produce corrugated paper in the range of 90 to 200 gsm at the maximum operating speed of 800 m/min, processing 100% waste paper. It features a two-layer Fourdrinier configuration with a hydraulic TT Headbox-SL. It is equipped with Toscotec's shoe press TT Xpress, as well as TT SteelDryers, steam and condensate system, and stabilization boxes in the dryer section. The supply also includes a hard nip calender, a hydraulic pope reel and the tail threading system. The scope is completed by mechanical drives, an enclosed hood, and air and ventilation systems. Unipakhellas selected a comprehensive service package with engineering, erection supervision, commissioning, training, and start-up assistance.

Fayssal Frem, Chairman of the Board and CEO of Unipakhellas, says, "Our decision to invest in Greece testifies to our belief that Greece is an actively growing market due to its geography and most importantly its human talents. The choice of Pelasgia's strategic location not only makes commercial sense, but it is primarily driven by Indevco's philosophy of furthering community development. We are confident that Toscotec will deliver on our expectations of high performance."

Imad Issa El Khoury, Executive Vice President of Indevco Paper Making, says, "We are very excited to partner with Toscotec on our first big project, which will enable UHC to serve the Greek and export markets with a wide range of high quality containerboard grades, supporting corrugated businesses to excel locally and in the European and Mediterranean markets."

Enrico Fazio, Sales Director of Toscotec P&B division, says, "We are proud to have been awarded the contract of a complete paper line to be installed in Europe. The new machine will feature all of Toscotec's state-of-the-art technology from TT Headbox-SL to TT Xpress, TT SteelDryers, and the hard nip calender. We got off to a very good start with Indevco team collaborating closely on all aspects of the project. This is the perfect opportunity for Toscotec to prove its ability to successfully manage such a challenging project."

Toscotec's tissue line starts up at GrandBay Papelera Internacional in Guatemala



GrandBay Papelera Internacional started up a double-width AHEAD 2.2L tissue machine supplied by Toscotec at its Rio Hondo Zacapa site in Guatemala. The new PM7 line will add over 60,000 tons to the mill's annual production capacity.

The GrandBay Group has recently signed with Toscotec to install a second AHEAD 2.2 tissue line (PM5) at Papeles Nacionales' Pereira facility in Colombia. Toscotec will supply the PM5 line as a turnkey operation scheduled to come online in 2024.

High performance and optimal energy efficiency

The AHEAD 2.2L machine (PM7) has a sheet trim width of 5,500 mm, a design speed of 2,200 m/min, and it is designed to deliver the maximum possible drying efficiency with the lowest energy consumptions. It is equipped with a shoe press of the upgraded design TT NextPress, a third-generation TT SYD Steel Yankee Dryer, and high efficiency TT Hood. Toscotec's patented TT SAF® DD (Short Approach Flow system with Double Dilution) ensures efficient stock dilution in two steps resulting in a significant reduction of electrical energy consumption.

"This is the first tissue line supplied by Toscotec that we have installed, and we are very satisfied with the project outcome" says **Alberto Matos, GrandBay Project Engineering Manager**. "The cooperation with Toscotec was very positive throughout the entire project. The start-up went very smoothly, and the machine is producing high quality tissue. We expect it to quickly achieve good runnability and high energy efficiency."

Pier Paolo Brunazzi, Toscotec Project Manager, says, "The partnership with the GrandBay Group is strategical for Toscotec, and we have been very much focused on achieving our common goal. We faced together the current worldwide shipment issues and managed to overcome associated delays with a strong effort from both parties. Today, it is a great satisfaction to see another one of Toscotec's machines successfully started up in the Latin America market where in last few years I personally managed three new tissue line projects."

Toscotec's TT Headbox-SL starts up on BiOrigin Specialty Product's MG machine in USA

BiOrigin Specialty Products started up PM2 at its Menominee site in Michigan after the successful completion of a wet section rebuild supplied by Toscotec on a turnkey basis. PM2 is a MG (Machine Glazed) machine producing specialty papers including MG grades and flexible packaging products.

A fully customized design

The project started with an onsite survey by Toscotec's technical team who identified the primary targets of the new design, in particular moisture profile and CD bone dry profile. BiOrigin Specialty Products (or 'BSP') selected Toscotec's design solution, valuing the importance of a fully customized technical offer based on the analysis of the machine's operating data.

Target achieved

The rebuild achieved its targets of remarkable enhancement of cross direction (CD) profiles of the paper sheet. In particular, the new TT Headbox-SL's dilution control allowed to improve the bone-dry profile; an optimized jet distribution and jet landing led to the improvement of the moisture and basis weight (BW) profiles.

The installation of dewatering elements with angle and height adjustable blades in the Fourdrinier section increased wire dewatering.

As a result, the rebuild improved the machine runnability, delivered definite potential for future production increase and improved sheet formation on all

produced grades both in absolute terms and across the machine width.

A turnkey rebuild

Toscotec supplied the approach flow system, a hydraulic TT Headbox-SL fitted with dilution control to ensure optimal profile control, and an upgrade of the Fourdrinier section. The turnkey supply of the rebuild included a complete service package with erection, erection supervision, commissioning, and start-up assistance.

Steve Michalko, BSP's Vice President Technical Service, says, "The entire project went smoothly from inception to successful completion without any significant concerns. The start-up curve was literally hours, and we continue

to see intended and unanticipated improvements. The solutions provided by Toscotec have eliminated previous operational constraints and positioned BiOrigin Specialty Products to improve both capability and productivity moving forward."

Luca Ghelli, R&D Director at

Toscotec, says, "Since the beginning of this project, BiOrigin Specialty Products and Toscotec's teams have been working in sync toward a common goal with a strong feeling of reciprocal respect. This kind of approach is in itself a recipe for success. The very positive outcome of the rebuild is of course the icing on the cake."



Toscotec to install 250th TT SYD Steel Yankee Dryer at WEPA France



WEPA France has selected Toscotec to install a TT SYD Steel Yankee Dryer on PM11 at its Bousbecque plant near Lille. The new Yankee will replace an existing cast iron cylinder.

Undisputed Steel Yankee market leadership

With over 250 TT SYD sold, Toscotec is the undisputed market leader of Steel Yankee Dryers holding a large majority of the global market share.

- Toscotec's TT SYD was the first Yankee dryer made of steel to start up in a tissue mill in 2000.
- TT SYD is present in more than 45 countries across 5 continents, and in Europe alone it has close to 95% of the market share.
- Toscotec holds the record for the longest and largest experience of design, manufacture, and service of steel Yankees in the tissue industry.
- TT SYD embraces a whole breadth of applications: conventional tissue, TAD, MG paper, and tobacco.
- Toscotec manufactured a 22 ft. diameter TT SYD - the largest diameter of grooved Steel Yankee Dryers in the world - and it has the capability to produce up to 26 ft. diameter.
- Building on 20+ years of monitoring and servicing steel Yankees that operate in the most diverse conditions across the globe, Toscotec has made strides in product development engineering 3

successive design generations of its TT SYD.

WEPA's target of sustainable production

This order is an integral part of WEPA's strategic plan to boost the energy efficiency of its operations and reduce CO2 emissions. Toscotec's Steel Yankee will ensure the highest possible energy efficiency in the drying section of the tissue machine, with substantial thermal energy savings compared with the existing cast iron cylinder.

Since WEPA installed its first Toscotec's Steel Yankee in 2006, it never went back to the old technology of cast iron dryers.

Aurelien Lebas, Technical Project Manager of WEPA, says:

"The installation of this TT SYD is aimed at reducing our energy consumption and overall carbon footprint, in line with our strong commitment to resource efficiency. It will also increase reliability and operational safety at our facility. Based on our long experience working with Toscotec, we expect to exceed our targets."

Riccardo Gennai, Toscotec's Sales Manager, says:

"It is a pleasure to work again with WEPA France after a series of successful rebuilds of PM11, and the start-up of PM18 turnkey tissue project at their mill. This order strengthens our partnership with the WEPA Group that began more than 20 years ago."

Toscotec rebuilds PM1 at Omnia Advanced Materials in USA

Omnia Advanced Materials has started up PM1 at its Beaver Falls facility (NY, USA) following a successful rebuild by Toscotec. After an idle period, the paper machine was modified to resume operations with the installation of a completely new dryer section. PM1 produces highly customized specialty paper including gaskets, absorbency, and filtration media for numerous industrial and consumer applications.

The rebuild: target achieved

Toscotec supplied the entire dryer section including 20 TT SteelDryers featuring a diameter of 1,250 mm (49.2 inches), a useful drying width of 2,175 mm (86.6 inches), and an operating pressure of 10 barg (145 psig). It also applied a non-stick coating on many of the steel dryers to ensure effective cleaning during the papermaking process.

Toscotec developed a customized

solution designed to deliver a significant increase in PM1's paper width compared to the pre-existing width. The rebuild achieved its target of increasing the machine's production capacity.

Gino Fronzoni, CEO and Owner of Omnia Advanced Materials, says,

"Following the successful project at our Alife mill in Italy in 2021, we decided to partner again with Toscotec for a strategic investment at our Beaver Falls plant in the US. Our trust in Toscotec has been rewarded by a competent and flexible team. Thanks to this upgraded technology and the increase in production capacity, we can now focus on strengthening our twenty year presence in North America's highly technological specialty papers market."

Enrico Fazio, Sales Director of Toscotec's Paper & Board division,

says, "It is always a pleasure to receive a repeated order. Toscotec has developed



a customised rebuilding solution designed to bring an idle machine back to life. This project has a strategic impact on the specialty papers market,

and it contributes to Omnia Advanced Materials continuous growth. We are happy to support them in this strategic expansion."

Toscotec enters nonwoven industry



Toscotec, a Voith company, is joining the market in the field of Wet Laid Spunlace plants with the supply of high-performance end-of-line machines including winders, rewinders and packaging solutions.

Voith and cooperation partner Trützschler Nonwovens have a long-standing cooperation for the supply of full lines for from fiber feed to End Section and already delivered several Wet-Laying/Spunlacing and Carded/Pulp lines to various customers.

Product Highlights

Building on its technological expertise in tissue, Toscotec developed a complete machinery portfolio designed to ensure product quality, high efficiency, and high production capacity to nonwoven producers.

OPTIMA WinderNW

- Electro-mechanical winding system and pneumatic clutch based on core-assist drive
- Superior nip control with load cells for bulk preservation
- Tension control to maintain product characteristics

OPTIMA RewinderNW

- An efficient web tensioning system prevents elongation loss: by continuously and precisely controlling the speed of the drive motors – also during machine acceleration and deceleration - the web is carefully guided through rewinding to avoid any stretching
- Automatic nip control system: the load cells installed on the rider roll and the core chucks send continuous feedback to the control system, so that the actual thickness and bulk of the wound reel is detected and adjusted in real time
- Uniform reel density throughout the customer's working shifts delivers an increase in winding efficiency
- Option to install a fully automated shaft puller

Packaging solutions

- Full Customization based on the customer's needs (production, available space, etc.)
- Best-in-class packaging technologies

Toscotec to supply new TT SteelDryers in USA

Toscotec has recently received several orders from a confidential US producer for a total of 30 TT SteelDryer cylinders. Through repeated orders, this confidential group has so far purchased close to 50 TT SteelDryers for installation at 4 different locations in the USA.

Replacing cast iron dryers with TT SteelDryers: a twofold advantage

The replacement of the existing cast iron cans with Toscotec's TT SteelDryers will deliver a twofold advantage to the paper mills:

- Increase production by boosting the paper machines' drying capacity and by enlarging the cylinders' drying width while maintaining the same face length.
- Ensure an easy and cost-effective replacement by preserving the same overall dimensions of the dryer section (machine frame, housings, bearings, and steam equipment remain unchanged). This is possible because the steel dryers are custom sized for every project.

Upgraded manufacturing capability: up to 10 meter width

In response to market demands, Toscotec has upgraded its manufacturing capability at its headquarters facility in Lucca, Italy. It is now producing TT SteelDryer cylinders of up to 10m (393 inches) width. The demand for these large cylinders comes primarily from North America, a strategic market for Toscotec.

Fabrizio Charrier, Sales Manager of Toscotec's Paper & Board division, says: "Toscotec is manufacturing

an increasing number of large TT SteelDryers, just as in the case of these new orders. The North American market is focused on two targets: production increase and technological upgrade. The latter derives from the need to replace dryer cans that have often been in operation for more than 60 years. TT SteelDryers achieve both targets, with the additional bonus of offering an easy equipment replacement and a very short machine shutdown."



Toscotec starts up AHEAD 2.2 tissue line at Saudi Paper Group

Saudi Paper Group (SPG) has started up a Toscotec-supplied AHEAD 2.2 tissue machine and OPTIMA slitter rewinder at its Dammam mill in Saudi Arabia. The new machine (PM2) is already producing high quality tissue.

The AHEAD 2.2 line has a sheet trim width of 2,850 mm, a maximum operating speed of 2,100 m/min, and an annual production capacity of over 30,000 tons. Equipped with Toscotec's upgraded shoe press design TT NextPress, a third-generation TT SYD Steel Yankee Dryer with patented deckle head insulation, and high efficiency TT Hood, the tissue machine ensures optimal energy efficiency. Toscotec also supplied the stock preparation system and its patented Short Approach Flow with double dilution, which guarantees a further reduction of electrical consumption.

In 2022, SPG placed a new order with Toscotec for the full-on turnkey supply of a new tissue line, including an AHEAD 2.2L machine (PM5) and two OPTIMA 2600L slitter rewinders. The project is slated to add 65,000 tons to the group's annual capacity in 2024.

Mohamed Abdelghaffar, SPG Group Operations Director, says, "We are very pleased with this successful start-up, and with Toscotec's ability to manage the entire project with flexibility and competence. We expect to quickly achieve excellent performances on PM2 both for tissue quality and production efficiency. SPG's project team is already working with Toscotec on the engineering phase of PM5, our new, double-width AHEAD tissue line. We are happy to continue this partnership, taking together another important step in our growth strategy."

Andrea Paganucci, Toscotec Project Manager, says, "The good cooperation between SPG and Toscotec throughout the entire project could only result in a successful outcome. Considering that Toscotec's new line replaced an older machine in an existing building, we've faced a few challenges linked to space restraints of the plant layout.

This is when Toscotec's well-known flexibility can really shine bright: the customized design we delivered has effectively resolved all these issues. We look forward to continuing this close partnership on SPG's second Toscotec machine."



IF WE COULD REVIVE YOUR TECHNOLOGY
MAKING IT COMPATIBLE WITH YOUR NEW NEEDS?

INSPIRING THE FUTURE

Something that already exists, that is reborn and becomes something else is a miracle. It is a bit like a metaphor for what happens when we rebuild a paper machine. We revive and bring them back to life with our expertise, technology and experience accumulated over years of installed machines. Thanks to the cooperation with Voith, we are now able to provide you with an even wider and more advanced product range. So yes, we revive your installations. With care. In Paper & Board.

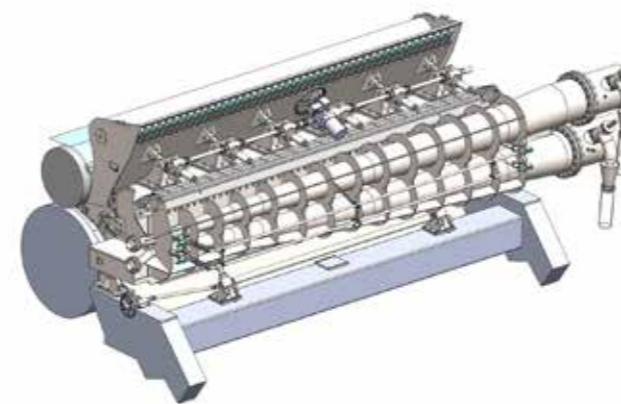
Toscotec's TT Headbox delivers superior performances in tissue

BY LUCA GHELLI,
R&D DIRECTOR TOSCOTEC

An old and popular advert promoting efficient, reliable, and user-friendly household equipment ended with the vigorous claim "Facts, not just words." The underpinning message being the guarantee of "actual results, not only promises."

While elaborating the list of Toscotec's TT Headboxes - 32 units since 2020, of which 23 in operations and 9 undergoing manufacturing - we were reminded of that popular ad.

Over the last 16 years, Toscotec has sold over 130 TT Headboxes to be installed on tissue machines, of which 32 have been in the last three years. The majority of these units were part of complete tissue line orders (23 units), some were part of major rebuilds (4 units), and the rest (5 units) were sold as replacements of existing headboxes.





forming section through precise slice opening control

- jet landing on the first dewatering part of the former

In order to ensure a proper and uniform feed, they are equipped with best-in-class instrumentation for the control of process parameters such as pressure, temperature, and consistency.

Actual Results: superior performances

After a short period of optimization and fine-tuning following start-up, all TT Headboxes have met the guaranteed figures and customer requirements, as high quality formation was always reached on all applications and on all grades. In several cases, the headboxes have set a new benchmark for paper formation, which was subsequently adopted also in other mills of the same group, and on various occasions also led to repeated orders.

TT Headboxes - those without dilution control and only the basic configuration of the slice lip controlled with manually operated micro jacks or micrometric screws, have always met bone dry profile guarantees within 1.5% of mean bone dry value when averaged over the control window corresponding to the adjusting spindle spacing.

For TT Headboxes equipped with automatic Cross Direction (CD) dilution system, the main operating parameters are:

- dilution flow accounting for 7 to 10% of the flow out of slice

The latter replaced headboxes manufactured by other machinery suppliers with the aim of improving paper quality and production performance. Since headboxes are normally sold with the complete tissue machine, the fact that paper producers are willing to replace only the headbox testifies to its importance, as it affects the machine's production both in terms of paper quality and energy performance.

Toscotec's TT Headboxes sold since 2020 vary in size, characteristics, and performance:

- 15 TT Headboxes have a pond width lower than 3,000 mm, while 17 units between 3,000 and 5,800 mm
- The majority are designed for high speed machines (up to 2,200 m/min)
- 5 TT Headboxes are equipped with paper profile dilution control (connected

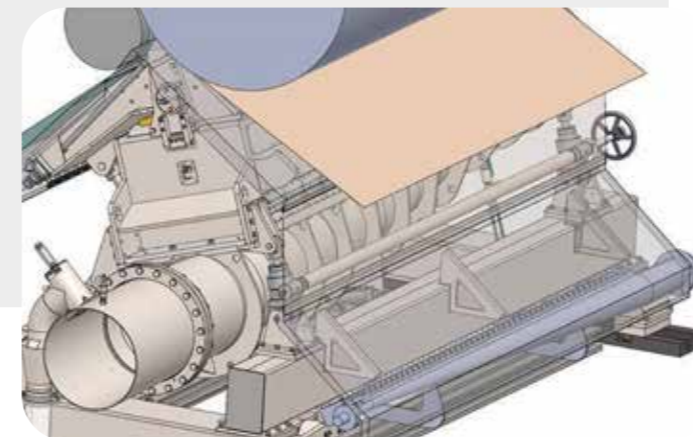
to QCS), while 5 units are designed for its future installation

- 21 units are single-layer TT Headboxes and 11 are multi-layer units
- 26 TT Headboxes are installed on crescent former machines and 6 units on twin wire former machines
- 3 TT Headboxes are installed on TAD machines and the rest on DCT machines.

Toscotec's headboxes produce high quality products - from facial and low basis weight toilet tissue (below 12 gsm) to towel tissue (up to 32-35 gsm) - processing different furnishes, including virgin fibers, de-inked pulp, and 100% wastepaper.

All TT Headboxes feature high flexibility in terms of:

- flow out of the headbox and into the



- pressure ratio (pressure in dilution header divided by pressure in headbox header) normally in the range of 1.3 – 1.4
- standard control window of 82 mm
- bone dry profile 2 sigma values below 0.8-0.9% (ratio of bone dry 2 sigma CD gsm/average bone dry gsm*100) for all products

The accomplished 2 sigma figures are based on the control window of the profiling system. Even when all scanner readings are used to calculate the 2 sigma figures, the variability never exceeds 1.5% of the average bone dry value.

Why is bone dry profile uniformity so important? Because after paper formation is completed, it is a crucial property as it normally translates into:

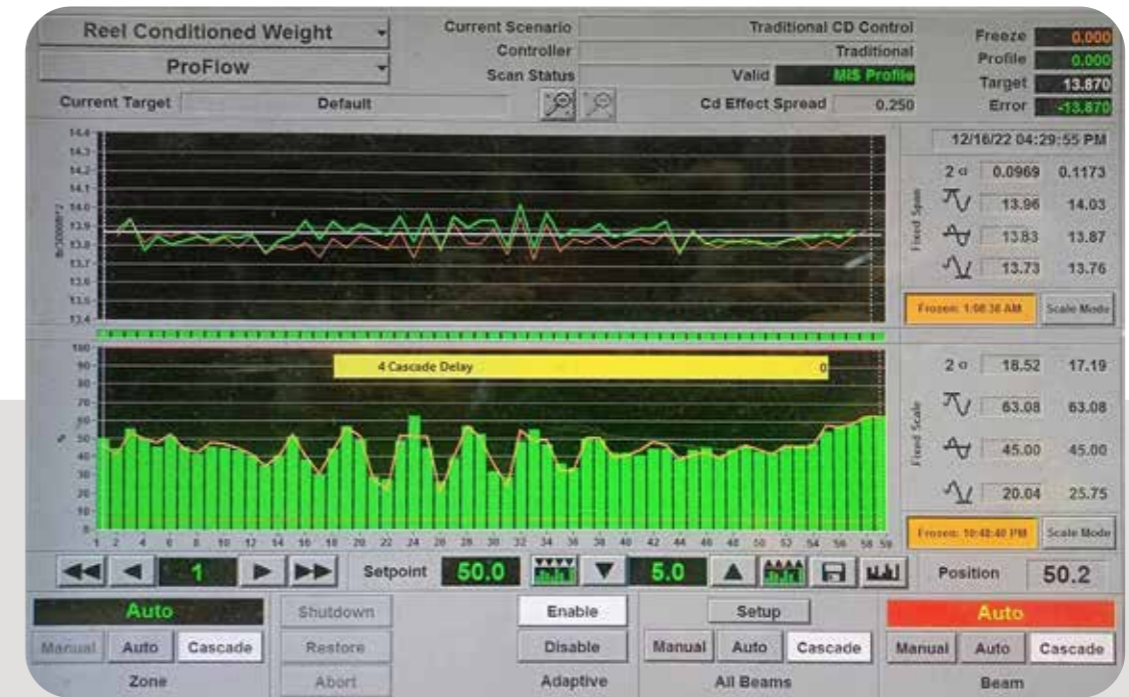
- better control of the Yankee coating
- avoid over-drying to compensate for lack of moisture profile uniformity with significant energy saving in the Yankee and hood area
- better moisture profile at the pope reel
- better runnability in the converting
- less complaints from final customers

TT Headbox: a successful technology

Optimal headbox performance and high quality paper production require an optimized control of stock injection and a proper selection/operation of the equipment in the approach system. A good control of the water recovery circuit is also key for smooth, clean, and efficient operation of the headbox, especially for furnishes such as wastepaper and de-inked pulp. Toscotec has developed a deep knowledge of the approach system design and best practices to avoid process disturbances, which could affect TT Headbox’s operations, enhancing both Machine Direction (MD) and CD profile control. As a result, it offers all the necessary support for the control of the complete process both upstream and downstream of TT Headbox.

The success of TT Headboxes derives from:

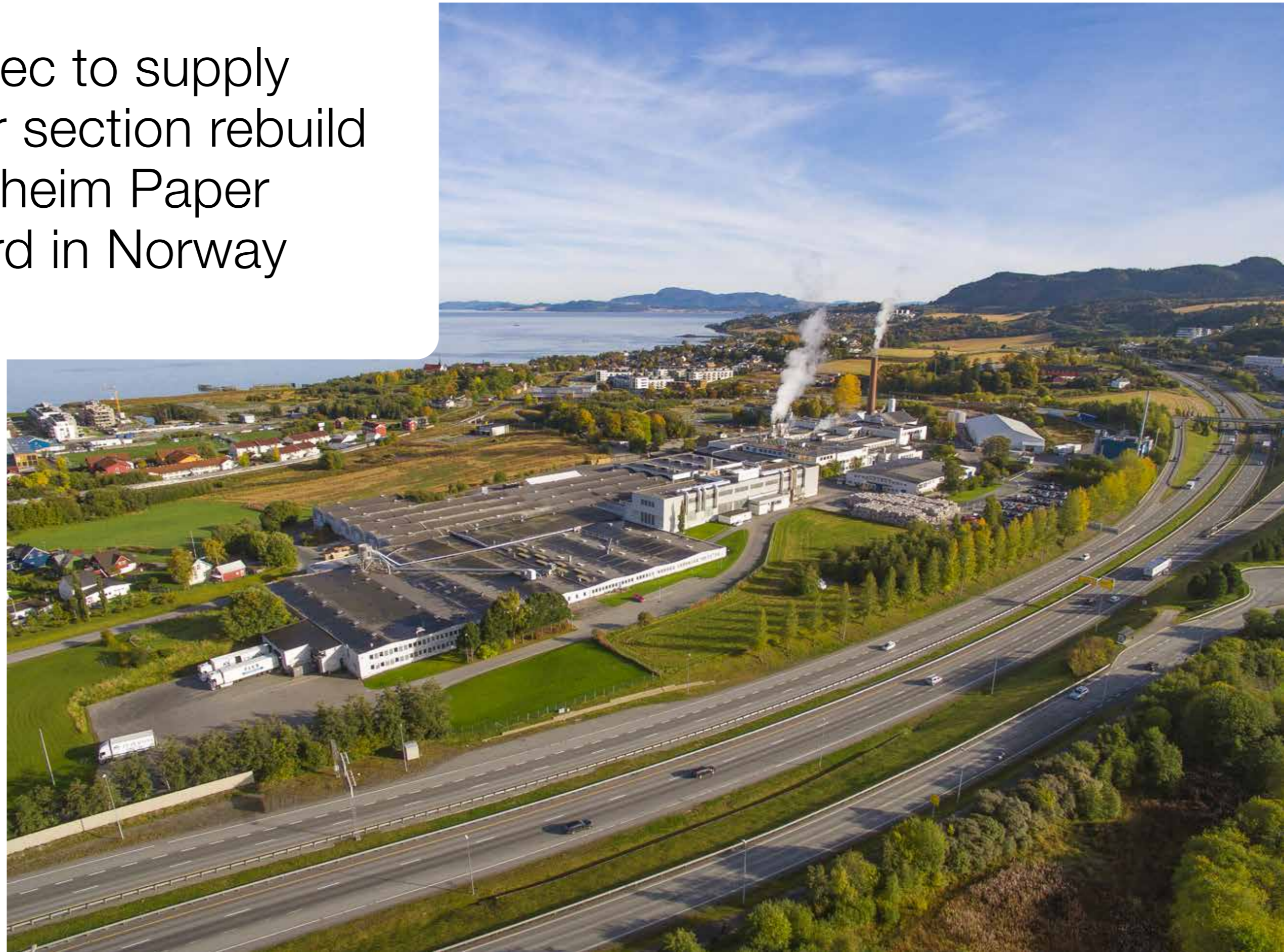
- extensive experience and deep product knowledge
- effective and precise manufacturing specifications
- optimal quality control of the final product
- stricter and more accurate quality control procedures of sub-suppliers.



Based on the increasing knowledge of the product, Toscotec has developed standard headbox specifications, which are then applied and customized for each customer based on the specific need in terms of flow, control capacity, and geometry of the application.

Besides quality and profile control results, the TT Headbox is close to 100% free of internal build up issues or the need of special cleaning requirements.

Toscotec to supply a dryer section rebuild to Ranheim Paper & Board in Norway



Norwegian manufacturer Ranheim Paper & Board selected Toscotec for the dryer section rebuild of PM5 at its paper mill in Ranheim, near Trondheim. Scheduled for the third quarter of 2023, the project will increase the paper machine's production capacity and efficiency. PM5 produces cardboard and solid board in the basis weight range from 220 to 540 gsm.

The rebuild of PM5's entire dryer section will consist of different phases. The first phase will see Toscotec supply new felt runs including stretcher and guide systems suitable for higher felt tensions, as well as some internal felt loops to deliver improved cleanliness. The target of this phase is to enhance the overall dryer section production efficiency by increasing felt tensions. The associated services include complete erection with supervision, commissioning, and start-up assistance.

Øistein Vedahl, Managing Director at Ranheim Paper & Board, says, "This rebuild represents a strategic investment aimed to increase the production and efficiency of PM5. We selected Toscotec because we knew their ability to successfully manage rebuild projects, and we were impressed with their technical solution during the discussion of the project."

Giancarlo Gianlorenzi, Sales Manager at Toscotec, says, "With this rebuilding project, Toscotec sets foot in a highly technological market. We are pleased to begin a cooperation with Ranheim Paper & Board in Northern Europe. Toscotec's ability to provide dryer section rebuilds that include customized engineering, project management, erection, and start-up all in one package has an interesting potential in this market area."



— More quality with less energy?

INGENIA

How to produce superior quality while using less energy?

This calls for an ingenious solution. **INGENIA**.

INGENIA makes it possible to produce premium quality structured tissue paper with substantially higher quality than textured tissue and close to Through Air Drying (TAD) produced paper, **but using 35% less energy.**

INGENIA is the answer to your company's needs and the expression of Toscotec's vision that combines superior efficiency with concrete sustainability.

Toscotec awarded ISO 45001 occupational safety certification

Toscotec has been certified to the International Organization for Standardization (ISO) 45001:2018 occupational health and safety management system. The certification was issued by Certiquality, an independent third-party assurance body validated by Italy's national accrediting agency Accredia.

Health and safety culture is considered of paramount importance at Toscotec. This new certification is part of a broader effort to prioritise safety through education, training, and awareness-raising activities at all its locations, and it confirms Toscotec's strong focus on identifying, addressing, and reducing potential risks. The ISO 45001 certification complements the company's long-standing ISO 14001:2015 and EMAS certifications.

Andrea Marzaro, Operations Director (COO) at Toscotec, says, "Achieving and maintaining ISO certifications is part

of Toscotec's corporate sustainability strategy. The ISO 45001 keeps us on the right track to monitor, manage, and deliver continuous improvement on our Occupational Health and Safety system. Along with our long-time environmental

certifications, day by day we put in place a valuable, reliable, and effective HSE (Health, Safety, Environment) management system and team."



Toscotec to install two MG dryers at Chandpur Enterprises in India

Toscotec will supply two TT SYD MG Steel Yankee Dryers for Machine Glazed paper to the Indian paper manufacturer Chandpur Enterprises Ltd. at their paper manufacturing facility near New Delhi in Uttar Pradesh. The MG dryers will replace the two local steel cylinders installed on their PM1 and PM2 that produce MG Paper in the basis weight range from 40 to 70 gsm. The start-up of the two dryers is scheduled for mid-2024.

TT SYD MG: Toscotec's Steel Yankee expertise for MG application

Especially designed for MG application, TT SYD MG dryers tap into Toscotec's 20+ year experience in the design and manufacturing of Steel Yankee Dryers. This expertise ensures the highest paper quality with optimal smoothness and an increase in the drying performances of MG machines. After the rebuild, the





reliability and thermal energy efficiency of TT SYD MG will substantially boost the performance of the complete production lines.

A big leap in production capacity and paper quality

The two TT SYD MG dryers are designed for a maximum steam pressure of 10 barg and have a diameter of 14ft and 16ft respectively for PM1 and PM2. In order to ensure optimal paper gloss, they will feature Voith's Terradry metallization, designed specifically for MG application.

The replacements have two targets. The first is to substantially increase the machines' production capacity overcoming the operating limits of the existing MG cylinders. The second target is to significantly improve paper quality, and moisture profile uniformity.

Amit Mittal, Executive Managing Director at Chandpur Enterprises Ltd., says, "These projects are an integral part of Chandpur's expansion strategy. We expect to achieve a strong boost in production output, in order to secure the increasing amount of orders we are receiving. Toscotec's advanced technology will allow us to be well equipped to reap the benefits of the current positive growth trend of MG Papers in India".

Giancarlo Gianlorenzi, Sales Manager at Toscotec, says, "I'd like to thank Chandpur Enterprises Ltd. for their trust in Toscotec's advanced technology in a market with strong price competition. Based on the positive results of our TT SYD MG's references, we are confident that they will achieve the competitive advantage and reliability they seek in the MG paper market."

We Tech Care



We believe in technology that is part of a larger project. In a design that creates a sustainable future for all. We believe in innovation. In change that opens up new paths, while balancing progress and the quality of life. We believe in responsibility. In a global vision that thinks about everything. About machines, about people, about the planet.



Toscotec launches E-Learning and Topic-based Training Center

Toscotec has successfully launched a new digital online Training Center, which offers in-depth and continuously updated technical information and user-friendly education tools. The onboarding of 10 tissue producers was completed in only three months.

Based on Voith's web portal, the new Training Center has been fully developed and operationalized by Toscotec. The responsible team composed of **Pietro Morrica (Training Technical Manager and Sales Support)**, **Lorenzo Melani (Technical Coordinator)**, and **Gabriele Belli (Technical Writer)**, answered a few



questions to point out its key features.

What does the Training Center offer?

Pietro Morrica: First and foremost, it offers immediate access to a very comprehensive set of technical information anytime and on any device. It gives customers on-demand learning tools for their new technology so that they can promptly and independently learn about and resolve many problems that require expert knowledge to fix whenever they occur.

What kind of training can you find in the Training Center?

Pietro Morrica: Both topic-based Training Presentations and animated E-Learning Video Procedures for all tissue mill equipment from Stock Preparation, Main Machine, Support Sub Systems, all the way through Finished Roll Handling after Rewinders. The topic-based Training Presentations gives easy to understand explanations of the technical and functional concepts of Toscotec's supplied equipment, how to set up the equipment properly, so those concepts work during operation, as well as in depth mechanical and electrical maintenance details of the various systems. Let's take for instance the Shoe Press, a user will find all information relating to its mechanical structure and working theory, the hydraulic P&ID diagrams with

explanations of the lubrication system components and function, its DCS operation (the tilt and all settings and adjustments), troubleshooting guides, and so on. In brief, all things Shoe Press from any point of view are included and easily accessible.

What about the E-learning part?

Lorenzo Melani: The E-Learning part is specifically designed for maintenance purposes, as it uses both animations and recorded video/pictures of actual equipment to clearly show each step of various maintenance procedures of the complex electro-mechanical automation systems. Firstly, being web-based, it can be accessed from any kind of device - pc, tablet, phone, or even augmented reality glasses/visor – on the mill floor while directly in front of the equipment. Secondly, operators can watch the video procedure they need to perform while doing it; they can simply play and pause the procedure as they go along. Finally, it is custom and all-inclusive, in the sense that Toscotec will work directly with a customer to develop whatever they will need and give suggestions according to our experience so all the information they need will be there. Before, maintenance operators worked with static mechanical assembly drawings, which required experience and advanced mechanical skills but don't offer any electrical and automation

detail. Or they had static procedures that gave limited sense of exactly which actions are needed. With Toscotec's E-Learning, we go from that level of abstraction and compartmentalized information to the reality of on demand, in the field, motion demonstrated, access to any information (mechanical, electrical, and control-related) in an easy to follow and immediate manner.

What does continuous update mean and why does it matter?

Gabriele Belli: Toscotec custom develops the training using the project specific 3D drawings of its technology in order to guarantee that the information given matches the actual machine installed at the mill. For operators and maintenance personnel on site, it is vital that the user manual, the topic-based Training Presentations and E-Learning are spot on to what's actually in front of them. We are in charge of continuous information updates in the Training Center, and it is a task we carry out daily. If there is an engineering change in the field, we can easily adjust the online material to match. So anytime someone goes online to view the information, the person is assured they are accessing the absolute latest and greatest design version.

Specialty paper producer Cartiere di Guarcino starts up Toscotec-rebuilt PM in Italy

Italian specialty paper manufacturer Cartiere di Guarcino has started up PM2 at its Guarcino paper mill after a successful rebuild of the forming and press sections supplied by Toscotec. PM2 produces high-quality decor specialty papers.

Targets achieved

The rebuild achieved its dual target of paper quality improvement and production increase. Firstly, the project ensured improved fiber distribution in Cross Direction (CD) by guaranteeing the efficient operation of the shaking system. As a result, Toscotec delivered enhanced formation and paper quality. Secondly, the press section rebuild increased post-press dryness, leading to

a production capacity increase.

A fully customized rebuild

Based on the analysis of PM2's operating conditions, Toscotec delivered a fully customized design solution applying both Toscotec's and Voith's technology in the forming and press sections.

In the forming section, Toscotec installed a customized breast roll and Voith's FloatBearings to enhance paper formation by boosting the performance of an existing shaking unit. It installed Voith's EdgeMasters on the forming wire to deliver optimal paper web edge, as well as successfully operationalized a new wire stretcher and tail cutting unit.

In the press section, the rebuild consisted in the installation of a new second nip with associated felt run, the overhauling of the hydraulic system, and a customized technological doctoring system equipped with savealls to improve water removal.

Simone Principia, Plant Manager of Cartiere di Guarcino, says: "Thanks to the good teamwork between Toscotec, Voith and CDG technicians, the start-up went very smoothly, and we continue to see performance improvements even beyond our expectations. The fully tailor-made technological solutions provided by Toscotec have increased PM2's

production and set a higher standard of quality, which is key for our customers."

Enrico Fazio, Sales Director of Toscotec's Paper & Board division, says: "The synergy with Voith was very successful on this rebuild, where we implemented the best tailor-made solution for Cartiere di Guarcino. In the high-end segment of decor papers, they are now fully equipped to meet the market's demanding requirements, thanks to their solid papermaking capability."





Toscotec starts up a complete packaging paper machine at Unipakhellas in Greece

Unipakhellas Central (UHC), a member of Indevco Group, have started up a paper machine and a slitter winder delivered by Toscotec as the main machinery supplier at their Pelasgia mill in Greece. The new line (PM5) is manufacturing high quality test liner and fluting grades for the Greek and international markets.

PM5 has a wire width of 3,000 mm, a maximum operating speed of 800 m/min and produces corrugated paper in the range from 90 to 200 gsm using 100% waste fibres. It features a two-layer Fourdrinier configuration with a hydraulic TT Headbox-SL. It is equipped with Toscotec's shoe press TT Xpress, TT SteelDryers in the dryer section, as well as a hard nip calender, a hydraulic pope reel and the tail threading system. The scope is completed by mechanical drives, an enclosed hood, and air and ventilation systems. Indevco, through its engineering company Phoenix, realized all the auxiliary plants.

Imad Issa El Khoury, Executive Vice President of Indevco Paper Making, says, "This was great teamwork between Indevco, Toscotec and other European collaborators during the pandemic to achieve successful results and a promising future for Unipakhellas."

Francesco Possenti, Paper & Board Technical Manager Toscotec, says, "The successful completion of this project is a great satisfaction. Toscotec realized the new line from a greenfield, including the building layout, the civil works and the entire paper machine from the headbox to the rewinder. Throughout the project when we were faced with challenges including the pandemic, local authorizations, erection and auxiliaries, the excellent cooperation with UHC made all the difference and we managed to effectively overcome every single issue together."

Toscotec starts up a Steel Yankee Dryer at Mirae Paper in Korea

Mirae Paper started up a TT SYD Steel Yankee Dryer supplied by Toscotec to replace an existing cast iron Yankee on PM2 at their Jeonju mill in South Korea. This is Mirae Paper's second TT SYD installation following another Yankee replacement by Toscotec on PM3 in 2013.

Market leadership through continuous development

With over 260 TT SYD sold worldwide, Toscotec is the undisputed market leader of Steel Yankee Dryers in the global tissue market. This leadership gives Toscotec a vast experience of monitoring and servicing steel Yankees that operate in the most diverse conditions across 5 continents worldwide. This combined expertise propels the strides that Toscotec continuously makes in product improvement developments.

The latest generation of TT SYD installed on Mirae Paper's PM2 benefits from an ideal ratio of the height, width, and distance between the Yankee's internal ribs and the optimization of its shell thickness. This design guarantees the highest possible thermal energy transfer efficiency at the drying heart of the tissue machine.

Following the global success of its Steel Yankees, in 2016 Toscotec set up its TT SYD Technology Center in Massa (Italy), an integrated facility fully dedicated to their manufacturing with a short and easy route to a seaport to accelerate shipping anywhere in the world.

Yeong Rok Lee, Mirae Paper's Production Manager, says, "We are very happy with the outcome of this second Yankee replacement by Toscotec. This new Yankee on PM2

has been performing very efficiently for over 2 months now. Just like our first TT SYD on PM3 has done for more than 10 years now, with great reliability and substantial energy savings."

Simone Pieruccini, Pressure Vessel Technical Manager at Toscotec, says, "Toscotec has without a doubt the longest and largest experience in

the design, manufacture, and service of steel Yankees in the tissue industry. This allows us to continuously raise the bar in terms of technological progress and service quality. We are happy that Mirae Paper can benefit from this experience on both PM2 and PM3, increasing capacity while reducing operational costs."





Toscotec delivers a press section rebuild to ETAP in Egypt

Egyptian linerboard manufacturer ETAP started up PM2 at its Borg Elarab mill, following a press section rebuild successfully carried out by Toscotec. PM2 produces testliner, kraftliner, top kraftliner and white top in the range from 125 to 240 gsm. In 2018, the machine had already been modified by Toscotec who entirely rebuilt its Fourdrinier wire section in stainless steel.

Toscotec successfully replaced an existing plain press in the first part of PM2's press section with a new bi-nip concept press, which has achieved a two-fold target. First, the increase of post-press dryness; and second, an efficiency increase of the entire press section through a substantial reduction of paper breaks.

Mohamed Ashour, Managing Director at ETAP, says: "On our second major rebuild with Toscotec, we are once again very satisfied with their ability to effectively manage the project from

inception to completion. ETAP has increased its production capacity taking advantage of Toscotec's advanced technology."

"ETAP is an important customer for Toscotec in Egypt and in the Middle Eastern market" comments **Enrico Fazio, Sales Director Paper & Board division Toscotec**. "We had a very positive cooperation four years ago, and we are very satisfied to carry on our collaboration with this project and to continue supporting them with Toscotec's expert services in the future."

Sameh Habib, CEO at Chemitex Egypt for Trading & Agencies S.A.E., says, "The partnership with ETAP has been successful for over two decades and we are very proud to contribute again to ETAP's growth by successfully landing their latest rebuild in collaboration with Toscotec. We look forward to more success with upcoming projects."



Toscotec launches Spare and Wear Parts in Voith Paper Webshop

Toscotec has successfully integrated its spare and wear parts portfolio into the Voith Paper Webshop. Customers can now order products quickly and easily around the clock using the latest functions. The Voith Paper Webshop has been operating for over six years and is constantly advancing to increase user-friendliness. Since June, Toscotec has onboarded more than 20 projects covering 3 multinational corporations.

The Webshop ensures easy consultation: users can access all the information they need on spare and wear parts in just a few clicks. It also allows for integration into the mill's ERP (Enterprise Resource Planning) system so that customers can use their internal codes when planning for and purchasing spares.

Lorenzo Bonino, Spare Parts Technical Coordinator at Toscotec, says, "On one single platform, customers can both access their technical documentation and purchase spare parts. Information is made available for an entire paper mill, so that the staff of that production site can find everything in one place: topic-based and E-learning training, maintenance and operation manuals, as well as spare and wear parts for all their Toscotec equipment."

Lorenzo Melani, Technical Coordinator of Toscotec Documentation Department, comments, "The Webshop saves time to the technical and administrative staff who search and purchase spares. They can access it from pc or tablet, and it allows for a much more quick, easy and efficient way to perform these tasks."

Toscotec starts up an AHEAD 2.2L tissue line at MEPCO

Juthor Paper Manufacturing, part of MEPCO Group, has started up a complete tissue line including an AHEAD 2.2L tissue machine and two OPTIMA slitter rewinders supplied by Toscotec on a turnkey basis at its new tissue mill in KAEC, Saudi Arabia. With this start-up, MEPCO, a leading containerboard manufacturer, effectively enters the tissue market.

The turnkey supply

The scope includes the entire tissue production line from cellulose bale handling to the wrapping and labelling of the finished wound jumbo rolls. The double-width AHEAD 2.2L line features a maximum design speed of 2,200 m/min and an annual production capacity of over 60,000 tons. It is equipped with a shoe press TT NextPress of upgraded design, a third-generation TT SYD Steel Yankee Dryer, and high efficiency TT Hood-Multigen with integrated cogeneration air system. The two

OPTIMA 2600L slitter rewinders ensure the preservation of superior bulk and softness.

Efficient tissuemaking with a Combined Heat and Power production (CHP)

The AHEAD machine is perfectly integrated with the mill's CHP system, in order to tap on its secondary heat production to meet the thermal energy needs of the tissue production line. The drying section of the machine uses the CHP-produced thermal energy both to generate the steam used in the Steel Yankee Dryer and to achieve the correct drying temperature of hot air circulating in the hoods air system. As a result, the tissue machine will rely entirely on the CHP system for paper drying and will not require any additional gas consumption and associated greenhouse gas emissions.

Adel Alfar, Operations Director at Juthor, says, "Our partnership with Toscotec has been marvellously successful. Even though we faced some challenges during the pandemic, we have successfully managed to deliver the test run and the commercial launch according to the scheduled timeline very smoothly and efficiently, producing premium quality tissue products."

happy of the positive outcome of this project. With a strong commitment to the project's targets, we have overcome the global logistical challenges encountered during the pandemic and kept our focus on our shared goal of putting this state-of-the-art tissue line into operation. We are confident that the mill will benefit from its superior efficiency and paper quality right away."

Stefano Raffaelli, Project Manager at Toscotec, says, "We are extremely



Toscotec to supply forming section rebuild to Gulf Paper Manufacturing

Toscotec will supply a forming section rebuild of PM2 to Gulf Paper Manufacturing at their Mina Abdullah paper mill in Kuwait. PM2 machine produces tissue from 100% virgin fibres, and it is scheduled for rebuild at the end of 2023. This is a repeat order for Toscotec who in 2019 successfully delivered a major dryer section rebuild of Gulf Paper's packaging paper machine (PM1).

The project aims to improve PM2's paper formation and basis weight cross direction (CD) control through an approach flow system upgrade and the installation of a state-of-the-art TT Headbox. The new headbox will be designed to match the high quality requirements for facial tissue in the Middle Eastern market.

Ghaleb Alhadhrami, Gulf Paper Manufacturing Projects & Development Manager, says, "With Toscotec's rebuild of our packaging paper machine in 2019, we achieved a substantial production increase, reduced sheet breaks by over 80%, and improved paper quality especially in the moisture profile and hand feel. We are confident that Toscotec will deliver on this new upgrade of our tissue machine as successfully as they did two years ago. This new headbox and approach flow system are also fit for a future rebuild into crescent former configuration."

Fabio Bargiacchi, Sales Manager at Toscotec, says, "A rebuild is always a challenge, as it requires strong engineering skills, experience, and flexibility. We are delighted that our tailor made solution was selected for this project. Our technology will support Gulf Paper to improve product quality and strengthen their tissue business. Toscotec consolidates its position in the Middle East, which includes 4 projects for super-soft facial tissue production awarded over the last two years."



Shawano Specialty Papers starts up Toscotec-supplied Steel Yankee Dryer in USA

Shawano Specialty Papers, a division of Little Rapids Corporation, started up a TT SYD Steel Yankee Dryer supplied by Toscotec at their paper mill in Shawano, Wisconsin, USA. It replaced an existing cast iron dryer on PM3.

Technological advantages

The new TT SYD has significantly increased PM3's production capacity and is ensuring higher operation safety. Compared with the replaced cast iron Yankee, it is delivering substantial energy savings, which reduce the overall operating costs of the tissue machine.

Indisputable market leadership

Toscotec holds a large majority of the global market share of Steel Yankee Dryers boasting more than 260 TT SYD sold worldwide. Since its first Steel

Yankee started up in 2000, TT SYD has been installed in every corner of the globe. It is now present in more than 45 countries across 5 continents, with a stronghold in Europe where it holds close to 95% of the market share. With this successful start-up, it strengthens its position in the USA as undisputed Steel Yankee market leader.

Michael Bogenschutz, Vice President and General Manager of Shawano Specialty Papers,

says "Toscotec provided excellent technical support throughout the entire project. Start-up of the new Yankee went smoothly, and the dryer is performing well. We are experiencing lower energy consumption and are seeing the potential for increased production efficiency."



Michael Drage, President of Toscotec North America, Inc., says, "Our latest-generation design Steel Yankee delivers the highest possible drying efficiency in the tissue industry, which is of course a deal breaker for any tissue producer. We

are happy to see that with this TT SYD Shawano Specialty Papers has gained a key competitive advantage to support their growth in North America."

Toscotec to supply production upgrade to Paper Prime in Portugal



Toscotec will supply a technological upgrade of Paper Prime's PM1 at their Vila Velha de Rodão mill in Portugal. Planned for mid-2024, the project aims to achieve substantial energy savings and production increase.

Turnkey Technological upgrade

Toscotec will rebuild the press section of the AHEAD 2.0 tissue line it supplied on a turnkey basis to Paper Prime in 2017. Originally equipped with a suction press roll with the possibility to upgrade to a shoe press configuration, the machine will install Toscotec's latest generation shoe press TT NextPress to enhance drying efficiency in combination with the existing TT SYD Steel Yankee Dryer.

The supply also includes a TT TurboDryer, which uses the heat recovered from the air system to strengthen the shoe press de-watering action and increase post-press dryness. The rebuild will be supplied on a turnkey basis, including dismantling and erection operations, erection supervision, commissioning, training, and start-up assistance.

Targets: Decarbonization and Speed-up

The project aims to achieve two targets. Firstly, it will slash PM1's thermal energy consumptions by 25% and

consequently significantly reduce the carbon emissions associated with its operation. Secondly, Toscotec will perform a machine speed increase from 2,000 to 2,100 m/min with associated capacity increase.

Paulo Lobo Correia, Chief Executive Officer at Paper Prime, comments,

"Focused on production efficiency, this technological upgrade will boost Paper Prime competitiveness and allow us to serve our customer base even better in the future. Toscotec has been our trusted partner since the beginning with the turnkey supply of our tissue line. We are confident that their expertise and reliability will guarantee a successful outcome on this new step in our growth."

Riccardo Gennai, Sales Manager at Toscotec, says,

"Decarbonization and Energy Efficiency upgrades are key for the European tissue market at a time where regulations are pushing for a profound industry transformation. Toscotec's technology delivers on efficiency and investment performance. We expect Paper Prime to start generating a positive return on this investment in less than two years."

Toscotec renews support for sustainability festival Pianeta Terra in Lucca



Toscotec has renewed its sponsorship of Pianeta Terra Festival, a far-reaching dive into Sustainability running from 5th to 8th October in Lucca, Italy. Following the vastly successful first edition of 2022, the festival organizers, the publisher Laterza and its director, prominent plant neurobiologist and author Stefano Mancuso, have decided to focus this second edition on the theme of “The Network of Life”, i.e. the dense, ingenious network that binds together all living creatures.

Sustainability is explored from a multidisciplinary perspective that spans across ecosystems, climate, new economic models, energy, agriculture, food, urban development, but also new political, social, philosophical,

anthropological, and artistic visions. The festival sets out to disseminate knowledge and prompt conversations around the theme of Sustainability, as well as promote a deeper understanding of our close interdependence with Nature.

“We are happy to renew our support for Pianeta Terra Festival among the great anticipation we are witnessing of its return to Lucca this October” says **Alessandro Mennucci, CEO of Toscotec**. “We look forward to seeing the festival hit a new record-high in public turnout, with people from our province as well as visitors joining in and reverberating the discourse on this crucial subject.”

Toscotec's Leadership in Turnkey Tissue projects leverages Expert Services

Toscotec's global leadership of turnkey tissue projects strongly relies on its high-performing and flexible services. Services play a critical role in turnkey projects, where Toscotec manages the supply of a tissue line from its design up to the successful achievement of all the performance guarantees and the customer's takeover. This range of services encompass mill engineering design, project management, in-house pre-erection, on-site erection, commissioning, training, start-up, takeover and after services.

Both the Project Management and the Service functions at Toscotec cooperatively work with customers in order to achieve the project's targets under the best possible conditions.

Flexibility and high performance are two major buzzwords for Toscotec's Service team.

In 2022, the turnkey project supplied by Toscotec to the leading Hungarian tissue manufacturer Vajda-Papír is a vivid example of such high performance and flexibility. This complete tissue line included a double-width AHEAD 2.2L machine and an OPTIMA slitter rewinder, as well as all the onsite erection operations, which alone required a team of more than 190 technicians over a period of approximately 200 days.

The results achieved after start-up testify to the efficiency of Toscotec's Service team. They include:



- Takeover achieved in just 20 days after start-up
- The very 1st Reel was acceptable for sale and sent to converting
- 1,800 m/min Operating Speed achieved within the first 3 days
- 2,050 m/min Operating Speed achieved within 4 weeks
- Machine efficiency in the first month

exceeded contract guarantees by approximately 70%

• Energy Consumptions have been very low and in line with performance guarantees from the beginning

Martin Schratte, Paper Technology Manager at Vajda-Papír, says, "Two aspects have been most impressive about this project. The first is the truly excellent cooperation between our team and Toscotec. And the second is

PM2's outstanding performance. I have personally followed the project from its outset, and I have to say that it was managed admirably well by Toscotec during all stages".

Francesco Ureni, Associate Chief Customer Service Officer at Toscotec,

says: "Starting from the 5th day after start-up, PM2 has been running 24/7.

Soon after, Vajda-Papír has taken the baton from Toscotec and successfully managed around-the-clock operations only with our Service team's support. The in-depth training of the previous months and their proactive participation during commissioning allowed them to get off to a very good start".



IF TISSUE TECHNOLOGY COULD RUN ON HALF THE ENERGY?

Less energy
Less water
Less CO₂

TT Energy Pack

A package of technological solutions for paper mills to save their energy.



Toscotec to supply a complete hood system rebuild to Lucart

Lucart has selected Toscotec for the complete rebuild of PM14's Yankee hoods and air system at their Aranguren tissue mill in Spain. The project is scheduled for the first quarter of 2024.

Tailor-made solution for drastic consumption reduction

Based on an onsite survey conducted to verify the existing system's performance, Toscotec developed a customized solution designed to deliver gas consumption reductions exceeding 30%, as well as a significant increase in machine run-ability.

The scope includes a high efficiency, gas fired TT Hood-Duo system, which ensures a perfectly uniform Cross Direction (CD) moisture profile. The new air system features low-emission burners, several stages of energy

recovery, and Toscotec's TT Swing, a patent pending solution that delivers maximum flexibility and energy savings in regulating the air system operation mode. By switching between a parallel and a hybrid configuration based on production needs, TT Swing guarantees optimal energy efficiency in the drying section of the tissue machine.

Luca Bini, Paper Mill Project Engineer at Lucart, comments, "We selected Toscotec because they proved their ability to dig deep and offer an efficient solution to the root causes of our problem, instead of patching up the old system. Based on our long cooperation, we are confident they will deliver the best possible outcome for Lucart both in the short and the long term."



Elena Troia, Energy & Environment Sales Manager at Toscotec, says, "Lucart has quickly validated our technical offer, because of the substantial consumption reductions we can guarantee and Toscotec's strong expertise in energy saving solutions. With this level of savings, we were able to guarantee a ROI of less than 2 years."

Long standing partnership
Lucart and Toscotec have a long established cooperation. Toscotec installed a complete tissue line (PM12) in 2018 at their Porcari mill, as well as 4 rebuilding projects including a hood and air system rebuild (PM4) in 2016, and 3 TT SYD Steel Yankee Dryer installations in France and Italy as replacements of cast iron Yankees in 2016, 2019 and 2020.



Toscotec to supply a turnkey tissue line to Softys subsidiary in Mexico

Softys has selected Toscotec for the supply of a complete tissue line at their facility in Altamira, Mexico. Scheduled for start-up in the first quarter of 2025, the new AHEAD 2.2 line (PM5) will be supplied on a turnkey basis.

Superior Drying Efficiency

The AHEAD 2.2 machine guarantees the highest available drying efficiency through the combination of TT NextPress shoe press, TT SYD Steel Yankee Dryer, and high efficiency TT Hoods. The shoe press is equipped with TT TurboDryer, which uses heat recovered from the air system to reduce water viscosity and enhance the shoe press's de-watering action to significantly increase post-press dryness. The Yankee hoods also feature TT Swing, an innovative solution

that delivers maximum flexibility and energy saving in regulating the air system operation mode. Based on the production needs, TT Swing can be easily adjusted to run as a parallel system (two separate circuits of heated air, one to the wet end hood and the other to the dry end), a cascade system (air from dry end hood flows into wet end hood before recirculating), or a hybrid system configuration (heated air to the wet end hood and only extraction from the dry end) in order to guarantee optimal energy efficiency in the drying section of the tissue machine.

Turnkey supply to ensure the Highest Performance

The supply includes the stock preparation, fiber recovery and water systems, Toscotec's patented TT SAF®

DD (Short Approach Flow system with Double Dilution), the AHEAD 2.2 machine with electrification and controls, auxiliary equipment, as well as dust and mist removal systems. The turnkey scope also includes the boiler plant, the air compression, chemical preparation and hall ventilation systems. Softys also purchased a comprehensive service package, which comprises the complete erection, the erection supervision, training, commissioning, and start-up assistance.

Pedro Urrechaga, Managing Director of Softys subsidiary in México, says, "We pursue our strategic growth in the Mexican market with a focus on the efficiency of our operations. With a clear view of our future, we selected

Toscotec for the supply of a state-of-the-art, energy efficient tissue line, in order to support our target of generating sustainable value for all."

Gabriele Romanini, Sales Manager at Toscotec, says: "We are pleased to partner with Softys on this strategic project. Toscotec's most advanced technology - especially the combined action of the shoe press and the Steel Yankee Dryer - will ensure the highest energy efficiency while the machine runs at its top performance. This new partnership with Softys also strengthens Toscotec's position in the Latin American market."



Toscotec starts up a complete press section rebuild at Cartiera Pirinoli in Italy

Toscotec started up a packaging paper machine at Cartiera Pirinoli after the complete rebuild of the press section at their Roccavione facility in Italy.

Toscotec installed a first nip with double felted press roll and a second nip with a Voith NipcoFlex shoe press designed for a maximum load of 1,600 kN/m. The project also included a fully automatic tail feeding system, felt runs, showers, rolls, doctors, as well as guide and stretcher systems.

The rebuild increases PM1's post-press dryness, reduces paper breaks and thermal energy consumptions. A high operation flexibility across a large basis weight range and the compliance with

new safety regulations are also crucial aspects of the project.

Silvano Carletto, President of Cartiera Pirinoli, says, "The successful completion of this machine upgrade allows us to cut PM1's consumptions and achieve higher flexibility in the operation of the press section. We especially appreciated the fact that we could find the correct settings of the machine immediately after start-up, almost effortlessly. Toscotec accompanied us throughout this strategic project with high expertise, competence and reliability."

"It's a pleasure to witness the startup of a technological upgrade such as

this, and we are very satisfied with its successful outcome" says **Marco Del Chiaro, Toscotec Project Manager**, "the fruitful cooperation with Cartiera Pirinoli's technical team throughout the project and the synergy with our Voith colleagues supported us in overcoming a few challenges. This rebuild will certainly boost the mill's production capacity."

Gian Luca Fornesi, Technical Sales Toscotec Paper & Board, says, "In the design of this modification, apart from the production aspects, we have paid particular attention to the optimization of the safety systems. With this new configuration, the mill personnel can operate the press section automatically in complete safety."



Toscotec supplied a dryer section rebuild to Les Papeteries de Clairefontaine



Graphic paper manufacturer Les Papeteries de Clairefontaine started up PM6 after a dryer section rebuild supplied by Toscotec at its Etival Clairefontaine mill in France. The machine produces graphic paper in the basis weight range from 60 to 100 gsm.

The project was focused on PM6's pre-dryer section for which Toscotec supplied TT SteelDryers designed for an operating steam pressure of 10 barg, as well as an upgrade of the machine frame. The associated services included the complete erection with supervision, commissioning, and start-up assistance.

The rebuild has achieved the target of increasing PM6's drying face length without changing the overall width of the machine frame.

Julien Courant, Production Engineer at Les Papeteries de Clairefontaine, says, "The project had a positive outcome. We have enhanced our paper quality by improving the moisture profile in cross direction."

Giancarlo Gianlorenzi, Sales Manager at Toscotec, says, "Through the cooperation with a well-established player such as Les Papeteries de Clairefontaine, Toscotec strengthens its presence in the French market. We were very happy to support the mill in the coordination of the project. Based on our vast experience in dryer section rebuilds, we are well positioned to continue serving this market area effectively."

Toscotec to supply a complete drying section rebuild to Rexcell in Sweden

Toscotec will supply a complete rebuild of PM1's drying section to Rexcell Tissue & Airlaid at its Skåpafors mill in Sweden. Planned for the second half of 2024, the project aims to support Rexcell to achieve substantial energy consumption reductions as part of its strong commitment to sustainability.

Energy Saving Customized solution

Toscotec will supply a customized solution designed to deliver substantial gas consumption reductions, as well as a significant increase in machine run-ability.

The scope includes a press section upgrade, a latest generation TT SYD Steel Yankee Dryer with new steam and condensate system, and a high efficiency TT Hood with a complete air system. The latter features various

steps of heat recovery and an advanced BMS (Burner Management System) to optimize combustion efficiency through precise control of the combustion air, where the burners are fit to make an efficient use of LPG first and biomethane in the near future. The hood plant is also equipped with TT Drying Equilibrium, a reliable system that automatically regulates the air balance in the hoods, thereby ensuring maximum drying efficiency, faster basis weight changes, and a production increase.

Two-fold target

The rebuild aims to considerably reduce PM1's thermal energy consumption through the use of state-of-the-art drying technology designed for energy efficiency, and to increase the machine speed and production capacity in the future.

Lars Andersson, CEO at Duni Rexcell, comments, "At Rexcell we take global environmental challenges very seriously. As a part of Duni AB, we share the same vision to be Net Zero 2030 along with considerable energy reductions. This machine upgrade is a strategic investment that perfectly fits into this vision. Toscotec's energy efficient technology will take us a step closer to realizing maximum energy savings and minimal material footprint."

Riccardo Gennai, Sales Manager at Toscotec, says, "It is a pleasure for Toscotec to cooperate with Rexcell who is on track to operationalize its transition from fossil-based to fossil-free sources. By developing a customised solution for the new drying section of their PM1, we will ensure the highest possible energy efficiency, as well as substantial energy savings compared to the present configuration."



Toscotec receives second rebuild order from Ranheim Paper & Board in Norway

Norwegian cardboard producer Ranheim Paper & Board started up PM5 at its Ranheim paper mill after a dryer section rebuild supplied by Toscotec. The rebuild has been completed according to schedule. Shortly after, Ranheim Paper & Board has placed a new order with Toscotec for the second phase of PM5's technological upgrade, which is scheduled for autumn 2024. PM5 produces greyboard and coreboard in the basis weight range from 220 to 540 gsm.

Phase one: targets accomplished

This start-up concludes the first phase of the rebuild of PM5's dryer section. The target of improving the production efficiency of the dryer section by better controlling the felt tensions and felt guiding has been fully accomplished.

Toscotec also re-designed several felt loops to be internal and thereby improved the machine's cleanliness.

Phase two: repeat order

The second phase will attain the highest felt tension in the dry end. The existing long shaft drive system of PM5 will be upgraded, with the application of a silent drive concept in the dryer section. Toscotec will also supply a completely new electrical drive and related control system for the entire paper machine. The service package includes the full erection with supervision, training, commissioning, and start-up assistance.

Øistein Vedahl, Managing Director at Ranheim Paper & Board, says, "During the first part of the upgrade of our paper machine, we got to know Toscotec,

its people and work methodology. We are confident that they are the right technological supplier for our strategic investment and are happy to continue partnering with them".

Giancarlo Gianlorenzi, Sales Manager at Toscotec, says, "This second order represents an important confirmation for

Toscotec. After one year of working on this project together, we established a very collaborative relationship. We look forward to carrying on this cooperation and to forming a long-term partnership with Ranheim Paper & Board."



Toscotec starts up a tissue line at Jumbo Centre in South Africa



South African tissue producer Jumbo Centre has started up an AHEAD 1.8 tissue line supplied by Toscotec at their Johannesburg facility. This is a repeat order for Toscotec after the successful installation in 2020 of another complete tissue machine at the same mill.

The AHEAD 1.8 machine has a sheet trim width of 2,750 mm, an operating speed of 1,800 m/min and a production capacity of more than 30,000 tpy. It is equipped with a new generation design TT NextPress shoe press, a third-generation TT SYD Steel Yankee Dryer, and high-efficiency TT Hood. The scope of supply covers the complete production line from the bale handling and stock preparation systems to the electrification and control system of the tissue machine. The associated services include detailed engineering, erection supervision, commissioning, training, and start-up.

Itzik Nikfard and Rafi Nikfard, Directors of Jumbo Centre, said, "This investment marks a new important stage of expansion for our business. The choice of technology is key in supporting the continuous growth and success of our SnowSoft brand. Toscotec's machines deliver premium tissue quality, high production efficiency, and energy savings which equip us to succeed in the market."

Sean Nieuwenhuys, Chief Operating Officer, remarked, "I have been acquainted with Toscotec for several years and been involved in the start-up of three tissue machines with Toscotec as the key technology provider and partner. Toscotec is known for fulfilling its technological commitments and helping clients achieve its efficiency and quality goals. I am confident that with this latest project, our business will reap the benefits of numerous technological advancements and improved energy efficiency. We anticipate that the new generation shoe press will enhance the bulk and softness of our products and improve the overall efficiency in our converting operations".

Matteo Giorgio Marrano, Toscotec Sales Manager, says: "Toscotec is proud to support Jumbo Centre in their decision to continuously upgrade their tissue making technology over the years to properly support their growth in the regional market. They moved from simple machinery to our energy-efficient MODULO-PLUS machine and now to this state-of-the-art AHEAD tissue line featuring Toscotec's best-in-class energy efficiency technology. An impressive journey in just a few years' time."



LUCCA, ITALIA
18-20 GIUGNO, 2024

Conversazioni ed
esperienze che ispirano
il cambiamento

Tissue Planet - Future Insights™ è l'evento che collega i principali gruppi cartari del mondo alle industrie della catena di approvvigionamento tecnologico al fine di migliorare l'impatto ambientale dell'intera filiera produttiva.

Speech ispirazionali, casi di studio e keynote, alternati a momenti di convivialità e networking, offriranno l'opportunità di trarre spunti per ispirare il cambiamento e promuovere lo sviluppo sostenibile dell'industria.

Tissue Planet - Future Insights™ è un evento organizzato da Toscotec, rivolto ai produttori di carta del mondo e accessibile solo su invito. Una scelta per favorire un ambiente di discussione concentrato, facilitare il coinvolgimento dei partecipanti e creare autentiche sinergie.

Toscotec starts up an AHEAD 2.2 tissue line at Europap Tezol Kağıt

Europap Tezol Kağıt started up a Toscotec-supplied AHEAD 2.2 tissue machine at its integrated production facility in Mersin, Turkey. The new high efficiency line started producing high quality tissue immediately after start-up. The project also included two OPTIMA slitter rewinders, with the first already in operation, and the second scheduled for installation soon. This is a repeat order for Toscotec who also installed a TT SYD Steel Yankee Dryer on their PM1 in 2012.

The AHEAD 2.2 line features a sheet trim width of 2,920 mm, an operating speed of 2,100 m/min, and an annual production capacity of over 40,000 tons. It is equipped with Toscotec's upgraded design TT NextPress shoe press, a third-generation TT SYD, TT BulkyReel for optimal preservation of bulk and softness, and high efficiency TT Hood with the automatic balancing system TT DryingEquilibrium.

The supply included the complete stock preparation system, Toscotec's patented TT SAF® DD (Short Approach Flow system with Double Dilution) to ensure electrical consumption reduction, as well as electrification and controls, and dust and mist removal systems. Toscotec delivered a comprehensive service package with detailed engineering, erection supervision, commissioning, training, and start-up assistance.

Ahmet Şenyavaş, Factories Director at Europap Tezol Kağıt, says, "The cooperation with Toscotec during the entire project was very positive. We are confident that this state-of-the-art tissue line will allow us to meet the high quality standards of our customer base, especially in terms of the softness and hand feel of our super-prime brands."

Matteo Giorgio Marrano, Sales Manager at Toscotec, says, "The high energy efficiency of this tissue

machine is ensured by the combination of Toscotec's latest generation design of TT NextPress and TT SYD with TT Hoods equipped with automatic balancing system. Europap Tezol will reap the benefits of this advanced

technology both for energy savings and superior quality. With this successful project, Toscotec takes a further step in strengthening its presence in the EMEA market."



Toscotec to supply major rebuild to Hamburger Containerboard Group

Toscotec will supply an entire dryer section rebuild to Hamburger Turkey, part of the Hamburger Containerboard Group, at their paper mill in Çorlu in Northern Turkey. The project focuses on their containerboard machine (PM3) and is planned for the end of 2024.

Targets: production increase and basis weight range expansion

The rebuild has two main targets. Firstly, the replacement of the existing cast-iron dryer cans with Toscotec's custom-sized TT SteelDryers will increase the sheet drying width by 90 mm while maintaining the same face length and using the existing machine frame. This will lead to an increase of PM3's production capacity.

The second target is to expand the basis weight range and produce lower grammages to enter a new market for lighter testliner products through an improvement in the wet section.

The scope of supply

Toscotec will supply thirty seven TT SteelDryers for a full upgrade of the dryer section and new TT UniRoll vacuum rolls in the first dryer group. The scope also includes all the mechanical drives and doctor blades of the dryer section. Toscotec will also upgrade PM3's press section and the sheet stabilization system from the press to the second dryers' group. The service package includes the erection supervision, training, commissioning, and start-up assistance.

Faik Ozturk, Project Manager at Hamburger Containerboard, says,

"Our cooperation with Toscotec began in 2020 when we purchased our first TT SteelDryer. This new rebuild is part of an important market strategy. It will bring great results with minimal intervention because it maintains the non-technological components of the machine. Therefore, we will realize the complete upgrade of PM3's dryer section in an easy and cost-effective way."

Fabrizio Charrier, Sales Manager of Toscotec's Paper & Board division,

says, "I'm very proud to have reached this agreement with Hamburger Containerboard in Turkey. Toscotec's customized technology precisely meets the needs of this project. This order also comes from an efficient and professional approach during the technical analysis phase. I'm confident that this synergy will lead to a long-term cooperation with their group on future projects."





TECHNICAL ARTICLE _ 30 DECEMBER 2023

(TISSUE)

Toscotec ramps up Water Reduction in tissue making

BY ELISA BERTOLUCCI,
FIBER SYSTEMS ENGINEERING MANAGER

Water is an essential ingredient in the tissue making process and its reduction is a very sensitive topic. It is necessary to find the right balance between water reduction advantages and disadvantages.

Water reduction leads to the closure of the process water circuit, which can affect the tissue making process. In this study, we will illustrate state-of-the-art solutions to substantially reduce water consumption ensuring an efficient paper production.

In this field, great progress has been made in recent years, but the increasing stress on fresh water availability and widespread calls to reduce water usage have put water reduction strategies at the forefront of technological development.

In this article, we analyse the best practices and most advanced available technologies to reach a freshwater consumption in the entire tissue making plant lower than 4 m³/ton paper.

This ambitious target can be reached by working on four main areas:

- Machine showers
- Suction roll sealing technologies
- Cooling utilities management
- Stock preparation

Water use in the industrial sector at large is one of the most important topics of

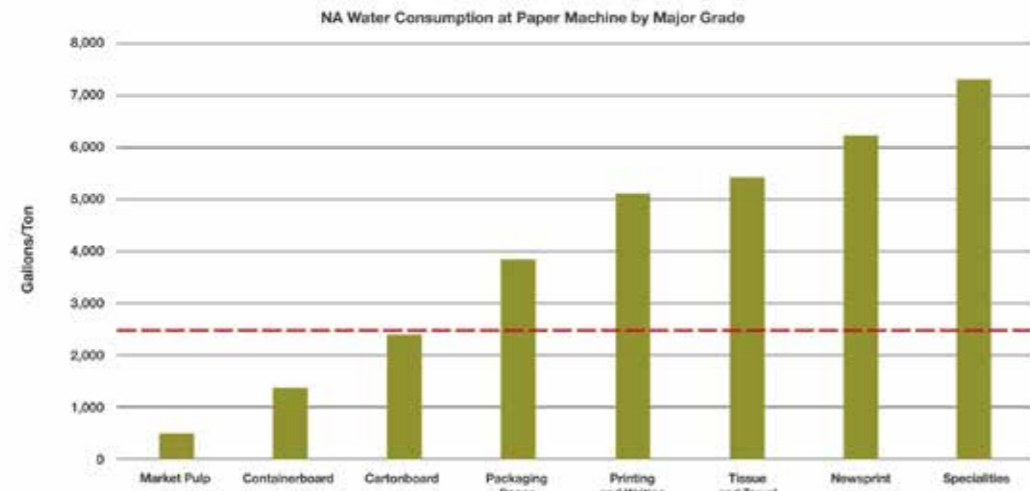
debate; in particular, in paper production this natural resource is an essential component for fibres transportation, equipment cleaning, lubrication, cooling and in the achievement of high tissue quality.

Due to growing economic and environmental pressures, water saving strategies are one of the most important driving forces for paper technology development. It is important to underline that pushing the tissue making process toward actual water reduction has significant negative impacts on several technological operations.

Water reduction approaches are very complex and bring to a progressive closure of the process water loop, which leads to accumulation of contaminants and may cause paper defects, deterioration of product quality and problems with tissue machine run-ability.

The degree of water loop closure is strictly correlated with the negative impact that may affect the paper process as shown by K. Olejnil et al [1] and J. Boguniewicz-Zabłocka et al [2]. In this context, it is crucial to establish the right equilibrium between advantages and disadvantages relevant to water consumption restrictions.

The water consumption of today's paper making processes varies between 5 and 20 m³/ton paper [1].



In particular, water consumption for tissue paper mills that work with virgin pulp is close to 5 m³/ton paper compared to mills that operate with recycled fibres.

There are two main approaches to water consumption, which can be combined to maximize water savings [3]:

- Implementation of advanced water treatment processes for wastewater recycling and re-use
- Development of new technologies that reduce water consumption.

The water re-use approach requires an advanced water treatment plant with

specific purification technologies such as flotation, biological reactors, and membrane filtration, as described by M. Karthink et al [4].

Toscotec has taken up this technological challenge and is actively contributing to the reduction of water consumption in tissue making through the development of new technologies and strategies which require less water consumption.

Toscotec has achieved a remarkable reduction of water use by focusing on four main areas:

- Machine showers
- Suction roll sealing technologies
- Cooling utilities management
- Stock preparation

In this paper, we present the best practices adopted by Toscotec, which ensure an overall plant freshwater consumption of less than 4 m³/ton paper.

All values reported below refer to a typical Toscotec tissue plant 2.2 with a max production capacity of 125 tpd. All water consumption figures calculated do not include freshwater use for chemicals preparation.

Machine showers

Tissue machine showers are the most demanding utilities in a tissue plant that uses virgin fibres. All sections of the paper machine need showers for different functions including cleaning, moisturizing, lubricating, edge trimming, etc.

Depending on their function and position

on the tissue machine, showers can be managed with different types of water (clarified water (CW), filtered clarified water (FCW), fresh water (FW)), with specific flows and pressures as described in the Technical Information Paper TIP 0404-61 recommendations.

Toscotec has optimized the design of machine showers by reducing their water pressure, especially on lubrication showers and by preferring the use of CW or FCW over fresh water whenever possible.

Moreover, the upgrade of their mechanical design (nozzle spacing and pitch, and orifice size) was aimed at reducing water consumption.

In the chart below, optimized shower's flows for Toscotec AHEAD 2.2 tissue machine plant are summarized:

SHOWER REQUIREMENT	TOTAL FLOW (IPM)
Continuous filtered clarified water	2645
Discontinuous filtered clarified water	160
Continuous fresh water	60
Yankee coating spray boom	8

The above values have been obtained by using filtered clarified water (which typically has a suspended solid content of about 20 ppm) and enhancing its quality through cascade filtration steps to reach an average suspended solid content of about 10 ppm.

Among all tissue machine showers, some positions are more critical than others. Firstly, high pressure showers are fundamental to keep the machine cloths clean from contaminants, avoid open area reduction and guaranteeing proper water drainage during sheet formation. Secondly, chemical cleaning showers play a crucial role in preserving the good functioning of the wire and the felt during the paper making process.

Traditionally, both high pressure showers and chemical showers used fresh water. Thanks to the higher quality of filtered water, it is possible to feed high pressure showers with filtered clarified water, thereby reducing freshwater consumption.

In summary, the use of continuous fresh water is required by the following showers:

- Chemicals showers
- Suction roll seal lubrication shower
- Trim showers
- Tail cutter shower

In this configuration, Toscotec ensures a tissue machine water consumption lower than 2 m³/ton paper while guaranteeing optimal machine performances.

Suction roll sealing technologies

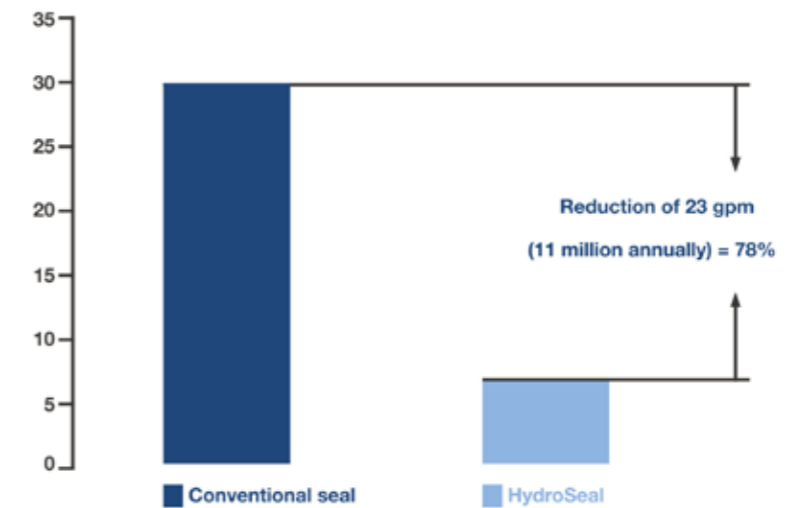
A traditional suction roll seal lubrication shower for a Toscotec AHEAD 2.2 tissue machine requires a freshwater flow of about 66 lpm to guarantee proper seal lubrication. Thanks to Voith's new HydroSeal technology, this freshwater requirement has been reduced by approximately 87%. The required flow with HydroSeal is around 8 lpm.

HydroSeal is a seal strip with a lubrication system designed to drastically lower water consumption in suction rolls installed in the forming and press section. Along with its water savings, it also increases drive operation efficiency, thereby reducing energy costs [5].

Upon installation of the HydroSeal seal strips, the mill realizes the following benefits [5]:

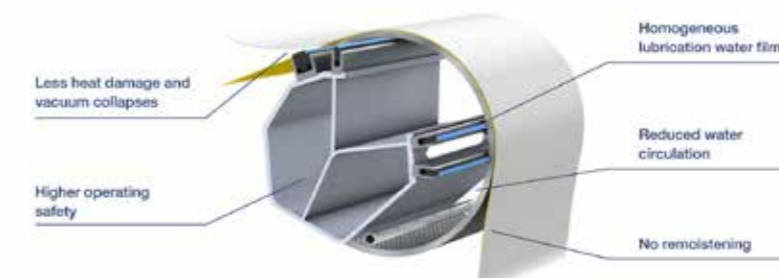
- 78% reduction in water lubrication for seals, producing \$17,500 and 11 million gallons of water in annual savings
- Improved seal strip lubrication performance for the mill's tissue production

Water consumption in gallons per minute



Additional benefits and advantages of Voith's HydroSeal:

- Constant and even lubricant feed at each seal strip
- Improvement of moisture profile due to uniform lubrication
- Higher operational safety of roll, fewer downtimes, lower maintenance costs
- No unwanted remoistening
- Homogeneous lubrication over the complete width

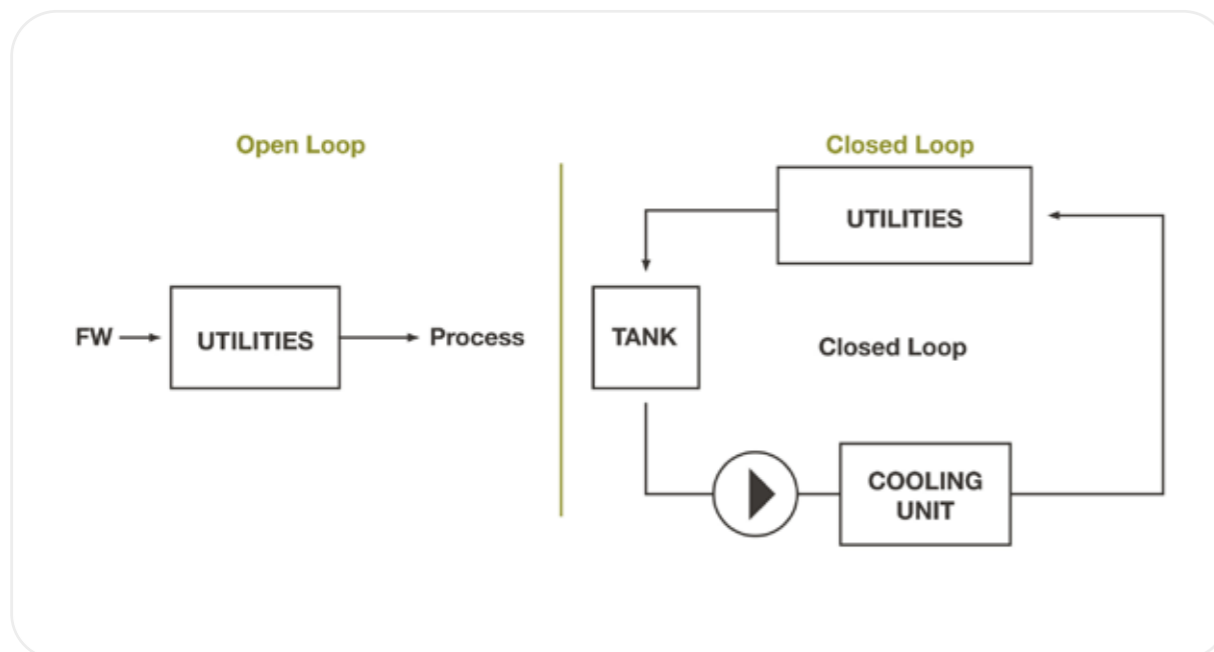


Cooling utilities management

The management of process water cooling can make the difference in water saving strategies.

In paper making plants, lubrication units, gearboxes and other utilities are

usually cooled down by water. The management of this water stream plays an important role in the overall freshwater consumption. Generally, cooling water can be managed through an open or a closed loop:



In open loop configuration, cold water is fed to the utilities and the resulting warm water can be used in the process for other purposes. In closed loop configuration, the warm water is cooled down through a dedicated cooling system and re-used to cool down the utilities again. Compared with the open loop, the close loop configuration reduces the amount of incoming fresh water through recirculation.

With the adoption of a closed loop management approach, it is possible to lower total water consumption to less than 4 m³/tons. This approach is usually more energy demanding than an open loop one, due to the cooling unit energy consumption.

There are several cooling units available on the market which have different operation concepts leading to different

energy and water consumption figures.

In this study three kinds of cooling units have been evaluated:

- Cooling tower
- Adiabatic liquid cooler
- Chiller unit

The cooling tower has the highest water consumption of all the above, usually this type of machine requires a constant water flow make-up of about 10 to 15 lpm.

The adiabatic liquid cooler has the lowest energy consumption, but still requires a water flow of 1 to 5 lpm.

Chiller units have the highest energy consumption but do not need a constant make-up of water. With reference to the case study of Toscotec AHEAD 2.2 tissue machine plant with a maximum production capacity of 125 tpd, we must cool down a total water flow of about 400 lpm, which can be managed in a closed loop configuration that guarantees a cooling capacity of about 282 kW.

According to the above data, a close loop configuration based on cooling tower technologies requires 7205 m³ of water per year and an annual electricity consumption of about 52,440 kWh.

Whereas, if one selected an adiabatic liquid cooler, the annual water consumption would drop to 692 m³ and annual electricity consumption would also drop to 13,585 kWh.

A proper chiller unit would allow to save water and reduce the annual water consumption up zero, but it would require the highest annual energy consumption of all three option, equal to 307,979 kWh.

Besides the energy and water evaluation, it is also important to underline that mill location plays an important role in the selection of the cooling unit. When the wet bulb temperature is too high, the cooling tower and the adiabatic cooler become inefficient, and a proper chiller unit is needed to guarantee the necessary cooling capacity.

Stock preparation

The following water-demanding utilities can be found in the stock preparation system:

- Agitator and pump seal lubrication
- Hoses
- Chemical preparation units

Selecting the right sealing type can make the difference in the water consumption of the overall plant.

Each seal type has specific seal water flow and pressure requirements. Gland packing seal is the most common seal type used for pumps and agitators. Gland packing offers a lower upfront cost and easier installation compared to mechanical seals, as it does not require decoupling of drive shaft, resulting in a shorter turnaround time but lead to higher water consumption.

In general, gland packing seals require 5 to 10 lpm which can increase if the sealing unit is not well regulated. In a typical Toscotec AHEAD 2.2 tissue machine plant with a max production capacity of 125 tpd where pumps and agitators are equipped with gland packing, the required water seal is about 100 lpm which accounts for 30% of the entire incoming freshwater flow. By installing mechanical seals on all pumps and agitators, it is possible to drastically reduce the total water seal flow (even though for certain equipment it is not possible to change seal type) reaching an overall stock preparation freshwater consumption of lower than 2 m³/ton of paper.

Another aspect worth mentioning is the amount of fresh water required for chemicals preparation and dosage. Chemical dosages and therefore fresh water required for chemicals strongly depend on water quality (conductivity,

impurities content, cationic charge demand, suspended solid content, pH, temperature).

All the above-mentioned parameters are strictly connected with the plant's water degree of closure.

Therefore, it is crucial to find the right balance between plant water closure (which mean freshwater reduction) and plant runnability.

The water requirement for the use of chemicals is not investigated in detail in this study, because there are several aspects that may come into play, including the sort of chemicals used, the type of production, raw materials, freshwater characteristics, etc.

Water reduction approaches are very complex and lead to a progressive closure of the process water loop which gives rise to contaminant accumulation, and may cause paper defects, deterioration of product quality and machine run-ability issues.

The water consumption of today's papermaking processes varies between 5 and 20 m³/ton paper.

Toscotec has taken up this technological challenge and is actively contributing to the reduction of water consumption in

tissue making through the development of new technologies and strategies which require less water consumption.

In this paper we summarized all the best practise and technological developments which allow to reach an overall plant freshwater consumption lower than 4 m³/ton paper.

The above figure can be reached acting on the different aspects of the tissue plant.

Thanks to machine showers optimization and Voith's new HydroSeal technology, it is possible to obtain a total tissue machine water consumption lower than 2 m³/ton paper. To this result, we have to add the stock preparation water consumption that can be lowered down to 2 m³/ton paper through cooling utilities strategies and seal selection.

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