INTERNATIONAL MAGAZINE ON TISSUE PAPER MACHINERY AND TECHNOLOGY

TissueMAG

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1/2017

SAVE THE TISSUE

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HammerLess, our new process to produce laminated 2-ply rolls without embossing.

HAMMERLESS

Gambini

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Dear Reader,

here is the first issue of TissueMAG, the new international magazine devoted to the technologies and services for the production and converting of Tissue Paper. The new magazine TissueMAG is distributed free of charge to paper mills producing tissue paper and converters of tissue paper located in various regions of the world. This issue is distributed in Europe, Middle East, North Africa and some bonus nations.

Therefore, May 2017 marks the foundation of TissueMAG that expects to double its issues in 2018: a first issue in May 2018 (postal distribution internationally) and a second issue in October 2018 (distributed during the MIAC exhibition in Lucca, which is held annually in Italy).

TissueMAG is not only a magazine but also a website **(www.tissuemag.com)** that amplifies the content distribution on a global scale. All operators in the tissue industry, wherever they are, from a PC, tablet or mobile phone, will be able to always access the same content of the magazine and a news and updating service on the tissue industry sector.

We wish you an interesting, fruitful and 'technological' reading!

Gianmaria Pfeiffer
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INTERNATIONAL MAGAZINE
ON TISSUE PAPER MACHINERY
AND TECHNOLOGY

TissueMAG

MAY 2017 / Issue 1

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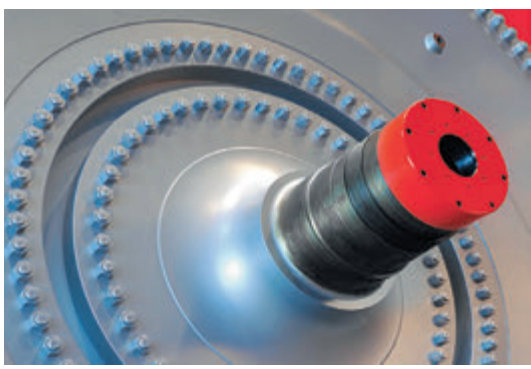

MAY 2017

Suppliers Sustainability Award 2016.

Sofidel launches its suppliers **Sustainability Award**

Sofidel, the tissue company most well known for its Regina brand, has stepped up its effort to promote sustainable development. Suppliers who have excelled in projects associated with environmental and social sustainability were honoured in Lucca.

by: TissueMAG

The winners of the first edition of the Sofidel Suppliers Sustainability Award were presented their awards in Lucca, near the Company's home in Porcari. This award, the first of its kind in the tissue sector, is coherent with the Group's commitment to promoting sustainable development. The aim of the award is to encourage, disseminate and promote environmental and social sustainability best practices and improvement actions among suppliers on a yearly basis.

Over 300 of the Group's suppliers - from Italy and abroad - participated in the initiative. They were assessed using the "TenP - Sustainable Supply Chain Self-Assessment Platform", created and promoted by the Global Compact Network Italia (GCNI) Foundation, of which the Sofidel Group is a "Founding Member and Sponsor". A performance self-assessment tool, built on the UN Global Compact's Ten Principles ("TenP"), which follows the most important and up-to-date international standards and conventions on sustainability. It takes into account human rights, working conditions, the environment and the fight against corruption, with the aim of identifying common challenges and solutions to improve sustainability in the supply chain.

"Launching this award is a natural evolution of our commitment to promoting responsible and sustainable growth which sees sustainability as a strategic lever for cultural and competitive development," explains **Luigi Lazzareschi, CEO of the Sofidel Group**.

"We have decided to promote this culture with our national and international partners by rewarding them for sustainable growth initiatives. This is because we are convinced that building a positive future for companies as well as for people and the whole world means moving towards an ever more widespread and shared commitment. Each of us, in our different fields and depending on our different roles, must take on new and broader responsibilities."

The award event for the Sofidel Suppliers Sustainability Award was subjected to ISO 20121 sustainability certification by SGS (Société Générale de Surveillance), world leader for certification, inspection, audit and analysis services. This sustainability certification is the international standard that certifies an event's zero impact on the environment based on parameters such as energy and water consumption and production of waste. SGS has ISO 20121 certified major events such as the Rio 2016 Olympics and the London 2012 Olympics and the 2016 UEFA European Football Championship.

SOFIDEL SUSTAINABILITY AWARD

Categories	Best supplier	Best Improver	Best Sustainable Project
	The company that has achieved the highest score on the TenP platform.	*The company that has obtained the best improvement in its results by setting up new environmental and social sustainability procedures.*	*Recognition awarded to the company that has implemented a particularly important environmental and social sustainability initiative.*
The winning companies	• Pulp Producers Category: **SCA Graphic Sundsvall AB** • Procurement & Purchasing Category: **Henkel** • Logistics Services Category: **Chep Italia** • Marketing & Sales Category: **Vizeum Deutschland GmbH**	• Pulp Producers Category: **Arauco** • Procurement & Purchasing Category: **TMC** • Logistics Services Category: **JC Trans (UK) Ltd** • Marketing & Sales Category: **Vizeum Deutschland GmbH**	• Large Companies Category: **Metsa Fibre Oy** • Medium Companies Category: **Imball Center srl** • Small Companies Category: **Kinect Energy**

> “Sofidel has reduced direct emissions of CO_2 into the atmosphere by 17.8%”

The Sofidel Group

The Sofidel Group, located in Porcari, in the province of Lucca, is one of the major manufacturer of paper for hygienic and domestic uses (tissue) in the world. Founded in 1966 and particularly well-known in Italy for the Regina brand, the Group is present in **13 countries** - Italy, Spain, the United Kingdom, France, Belgium, Germany, Sweden, Poland, Hungary, Greece, Romania, Turkey and the United States - and has over **5,500 employees**. With more than one million tonnes in annual production capacity, the Group holds second place in Europe and sixth place worldwide in the sector, and in 2015 recorded a consolidated turnover of **1,809 million Euros**.

In its value chain, Sofidel places strategic importance on sustainability for growth and development, setting the reduction to a minimum of its own environmental impact and the maximisation of social benefits as objectives. Sofidel, in fact, believes that companies have the responsibility of playing a fundamental role not only in terms of the production and distribution of goods and services, but also in the guaranteeing of long-term social and environmental advantages for stakeholders at all stages of the value chain. Sofidel is the first Italian manufacturer and the first company in the world from the tissue sector to join the **WWF Climate Savers** project, aimed at

> “Sofidel places strategic importance on sustainability for growth and development”

market-leading businesses with regards to the low carbon economy, which sets particularly ambitious objectives. As of today, Sofidel has reduced direct emissions of CO_2 into the atmosphere by 17.8% thanks to investments in energy efficiency, in the use of cogeneration plants and the use of renewable energy sources. Another fundamental area of action is the sourcing of cellulose from certified and managed sources (FSC, PEFC, SFI), which has reached a level of almost 100% (99.97% - 2015).

▼ Luigi Lazzareschi, CEO Sofidel Group.

The Sofidel Group's products and business lines

Sofidel's production is divided among different business lines, according to the market served (consumer or business), the brand policies (brand or private label) or the product in question.

All the products are characterised by a number of common strengths, from innovation to safety, as well as well-being for people and the environment, with a view to responsible consumption. For all of its products, Sofidel guarantees the highest levels of comfort, hygiene, practicality and value for money for consumers in all situations (home, the workplace, public services, areas of intense traffic etc.), and respect for the most wide-spread international standards for self-monitoring in health and hygiene, for the highest possible levels in physical, chemical and biological safety. The objective is to make products with an ever lower ecological impact which are, at the same time, ever more efficient; products that contain lower levels of natural capital thanks to higher levels of functional quality and to innovative performance.
Sofidel's production is divided into **four business lines**, which bring together the reference brands:

- **Brands**, products for the consumer market aimed at families in the toilet paper, paper towel, napkin and handkerchief sectors (*Group Brands*: Regina, Softis, Le Trèfle, Sopalin, Nouvelle, Thirst Pockets, KittenSoft, Nalys, Cosynel, Yumy, Soft & Easy, Volare, Onda, Lycke, Forest).
- **Private Labels**, products for the consumer market sold with Large-Scale Distribution brand names or with other brands belonging to the Group, such as Nicky, Valenty, Florex, Daily, Talent, Temis and Tyril.
- **Away from Home**, products created specially for use outside of the domestic environment, from hotels to restaurants, from service stations to public buildings and hospitals (*Group Brands:* Papernet, Heavenly Soft).
- **Rolls,** semi-finished products for the transformation market. ●

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Sofidel's Suppliers Sustainability Award has been realised in association with:

- **Global Partners:** Elettric 80, Fabio Perini, Södra, Henkel
- **Premium Partners:** SAP, Pulsar, Industria Cartaria Pieretti
- **Official Partner:** Treedom
- **Media Partner:** Tissue World Magazine

The TOSCOTEC INFINITELife Service

for Steel Yankee Dryers offers all-around service programs and tools to check the Yankee's runability and performance

The Steel Yankee Dryer (SYD) is the heart of the tissue machine. Regular maintenance, inspections and periodic checks are the key factors to keep the Steel Yankee Dryer operating at the maximum performance.

by: TOSCOTEC Yankee Dryer Service Dept.

TOSCOTEC **INFINITELife Service** provides dedicated and specialized service programs to maintain the optimal performance over time and achieve an endless life of the Yankee Dryer, not to mention avoid damaging surrounding equipment. As the pioneer in manufacturing TT SYD Steel Yankee Dryer, Toscotec's service network has the unique experience to support and improve the Steel Yankee Dryer operations.

Annual Inspections and Periodic Checks

Toscotec recommends at miminum to annually carry out a metalized coated surface inspection, a SYD internal inspection, and condensate removal system check. The annual technical

▶ IR thermography service.


ICE TEAM

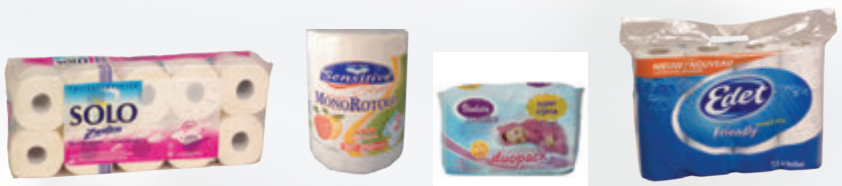
> Toscotec recommends at miminum to annually carry out a metalized coated surface inspection

inspection services that Toscotec can provide includes:

- **Metalized Coated Surface Visual Inspection**. A scratch in the metalized coating can turn out to be serious damage for the run-ability of the SYD and a quick repair can save the entire coating of the Yankee. *"Spot repair"* is a simple technique that can be used in many of these cases. Signs of chatter marks can be a symptom for problems on the paper machine such as: Yankee doctors vibration, frame vibration resonance, chemical coating application or improper process parameters.
- **SYD Internal Inspection and Condensate Removal System Check**. The correct distance of the soda straws from the bottom of the groves in the Yankee is important to keep a good paper moisture profile. We check every soda straw one by one along with their blocking clips. We inspect the inside of the straws for the presence of magnetite build-up. The scheduled check of all the condensate removal pipes seals and their status avoids risks of heat transfer efficiency reduction in your Yankee. We check the pipes condition, the bolts, safety wires, and the seals in each joint.

With the aim of increasing the efficiency of the paper machine and to avoid unplanned and adverse shutdowns, the following additional focused investigations on the Steel Yankee are highly recommended and can be performed by our technicians during the Annual inspection:

- Preventive Safety Program check, in order to verify the general function of the Steel Yankee Dryer safety interlocks;
- Monitoring and measurement of the main SYD steam parameters during operations (e.g. steam blow through rate and differential pressure);
- SYD temperature profile data collection with contact thermometer and Infrared (IR) thermography scanner;
- SYD diameter measurement (hot and cold condition);
- SYD blades geometry check (creping angle, crown profiling, loading PLI etc.);
- Warm-up and cool-down procedure check;
- Condensate and boiler water chemical analysis for magnetite build up detection.



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> “Unique experience to support and improve the Steel Yankee Dryer operations”

▲ TOSCOTEC INFINITELife Service for Steel Yankee Dryer.

2 Years After Initial Start-up (then subsequently every 5 years) Checks

For safety reasons, possible compliance with the Local Authorities' pressure vessel regulations, and possible insurance requirements, Toscotec recommends inspecting the structural welds and connecting bolts using the following ASME certified compliant Non Destructive Examination (NDE) methods:

- **Magnetic Particle Inspection (MPI)** on the internal circumferential welds of the heads, manholes welds and along the shell longitudinal welds from inside of the SYD (Fluorescent, Wet Particle Method).
- **Standard Ultrasonic Testing (UT)** on 100% of the circumferential welds on the center stay, on 100% of the bolts connecting the center stay and the heads and on 100% of the bolts connecting the journals to the heads.
- **Ultrasonic Phased Array (PA) and Time of Flight Diffraction (TOFD)** on 100% of the circumferential shell-heads welds (tending and drive sides) from outside the SYD and on the 100% of the longitudinal welds from outside of the SYD.

An ASME certified report will be supplied that can be used for both local regulatory required scheduled inspections and for insurance purposes.

More information, guidelines and tips can be found in the TT SYD (TOSCOTEC Steel Yankee Dryer) User Manuals that are always supplied with every TT SYD and that can be followed in order achieve maximum performance and an infinite life of your Steel Yankee Dryer. ●

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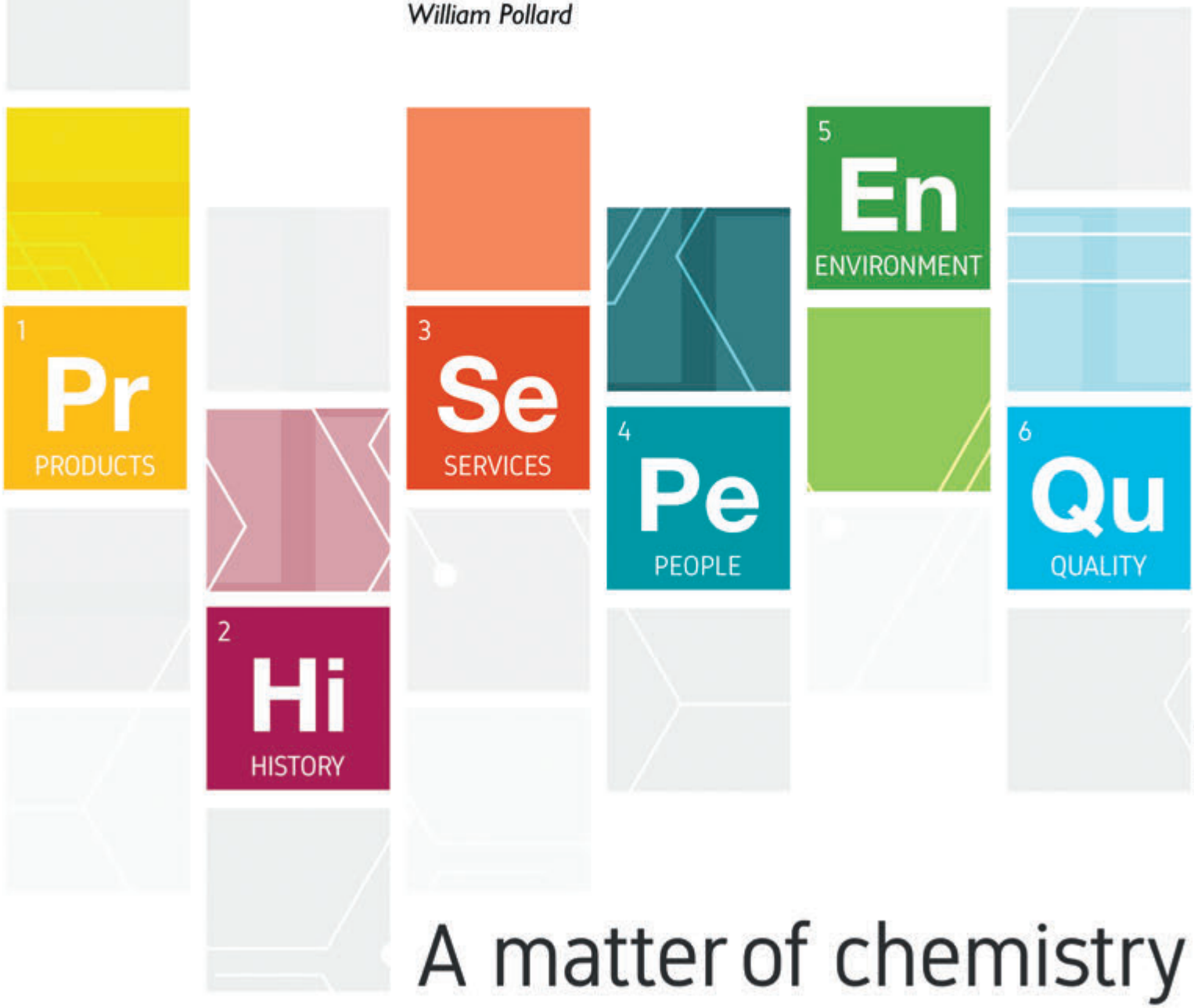
mare

experience the alternative

"Without change, there is no innovation, creativity or incentive for improvement. Those who initiate change will have a better opportunity to manage the change that is inevitable"

William Pollard



A matter of chemistry

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Fabio Perini S.p.A. expands the boundaries of converting technology: **the Constellation effect**

With the launch of Constellation™, Fabio Perini S.p.A. inaugurated a new era in tissue converting.

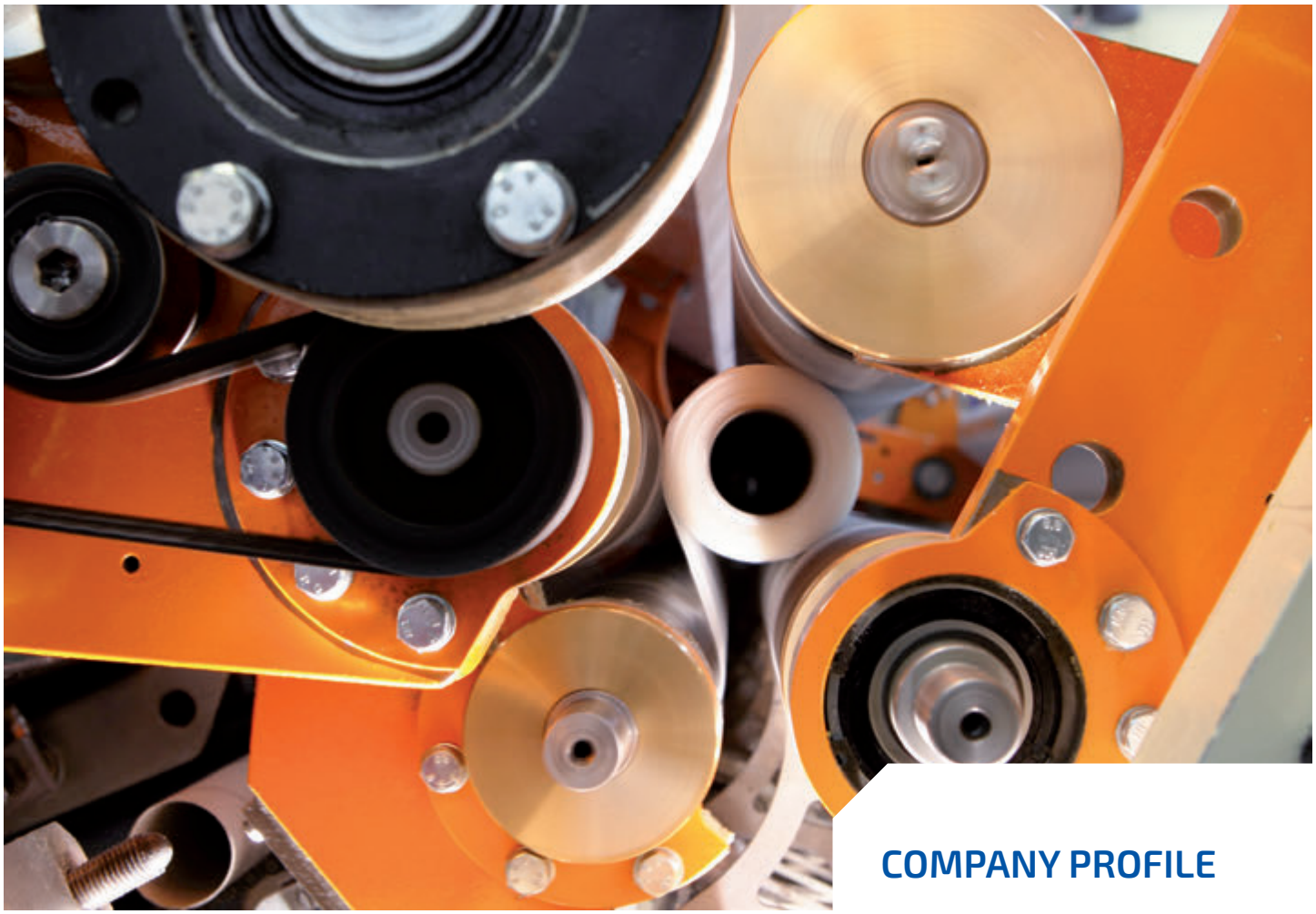
by: TissueMAG

The headquarters of Fabio Perini S.pA. in Lucca - Italy.

Presented in June 2015, Constellation™ has quickly become a success on a truly global scale: in just 18 months, over 50 lines have been sold throughout the 5 continents. A result fruit of considerable investments in means and people: 3 Constellation™ lines in Italy, Brazil and the USA are dedicated to customers to perform test and to confirm in an industrial production setting Constellation™'s exceptional performance in terms of product and technology. All these benefits are certified by the new Pivot service.

Pivot is much more than a laboratory for the characterization of the toilet roll or kitchen towel: it is the missing link between technology, the industrial process and the market. A holistic vision of business that allows generating true value in a commodities market such as tissue.

Constellation™ is the technology patented by Fabio Perini S.p.A., a solution that offers unprecedented winding quality. An innovative geometry consisting of mobile rolls with independent drives accompany the log from first to last sheet with consistency and uniformity. Complete log control during its formation

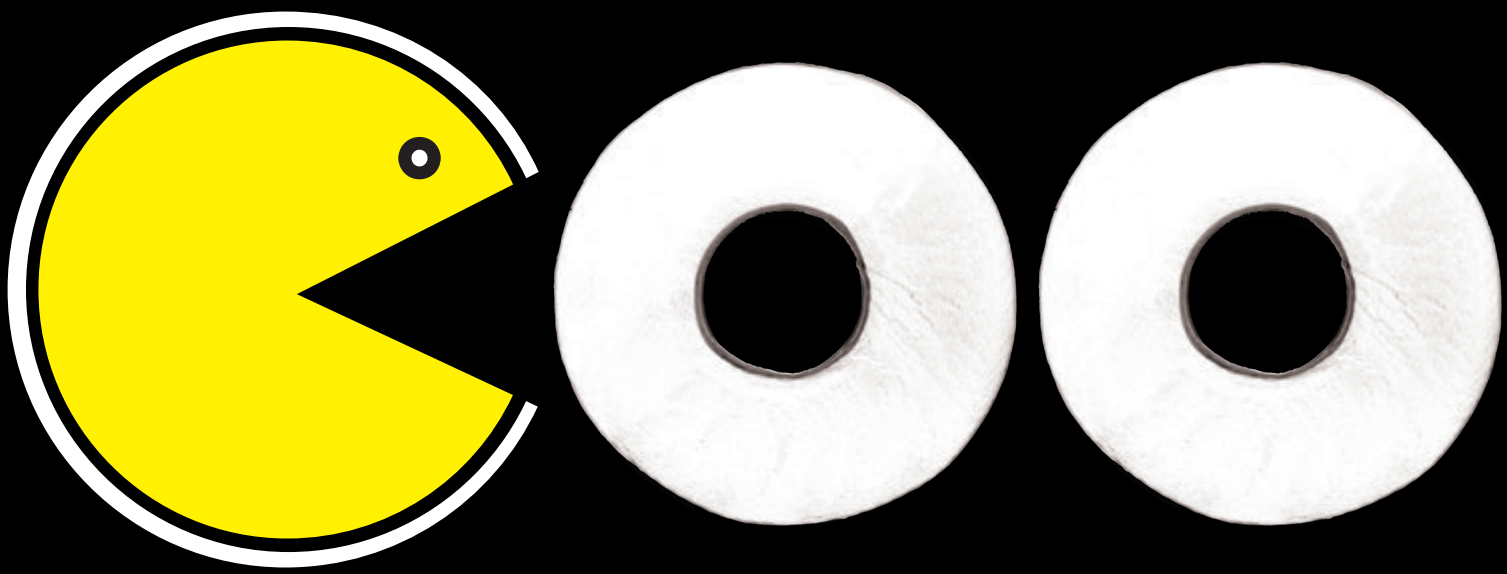


allows attaining production efficiencies unobtainable before. Log growth during winding is managed by an innovative algorithm that characterizes Constellation™ technology, and the machine operator's experience in continuous parameter setting is no longer an issue, thus eliminating variability in the finished product. "Constellation™ is a milestone for the tissue industry", comments **Matteo Benedusi**, CSO at Fabio Perini S.p.A. "because it represents perfect winding, something never attained with traditional technology until today. And also because it is oriented towards Industry 4.0. thanks to the on-board software and hardware that allows interacting and retroacting with the machines upstream and downstream of the rewinder. This means optimizing the production process and hence maximizing the competitive advantage for all our customers".
"The most important challenge we are faced with today", states Matteo Benedusi "is given by Industry 4.0. A great process change in the field that we have decided to interpret through our own vision that we have called Digital Tissue™".
From the point of view of service, WeAreAble - Fabio Perini S.p.A.'s solution for remote assistance - is today a reality in our customers' facilities. "A solution designed and produced for the industrial manufacturing field", continues Matteo Benedusi "that allows benefitting from the experience matured by our technicians expert in maintenance and technical assistance in converting and packaging, as if they were actually present at the customer's plant. It is a helmet with on-board

COMPANY PROFILE

Fabio Perini S.p.A. was born in 1966 in Lucca, Italian hub and world tissue production and converting technology center. Today, with its 5 production facilities in Italy, the United States, Brazil and China, it helps its customers stay competitive and grow thanks to complete production solutions for converting and packaging. Technology, globalization and ongoing, continuous investments in research have led the company to stand out internationally and to be acknowledged as a true excellence in the world of tissue.

PACK-MEN



High speed, great flexibility, excellent productivity.
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technology that allows sharing in real time videos, audio and documents between the operator on-board the machine and the expert online at our company’s technical center”. The WeAreAble device is comprised of bi-directional audio-video instrumentation. Thanks to the incorporated visor, the two support video cameras - one located directly on the helmet and one hand-held - and the integrated audio and data connection, the technician from the assistance center can see exactly what the operator sees with WeAreAble and supply indications on how to proceed with resolving the problem. Additionally, through the incorporated visor, he/she can provide the line operator with line diagrams in virtual reality, useful for intervening on the system. To alert and involve the group experts quickly and simultaneously, all that is required is to activate the connection from any part of the world the operator is in. “The WeAreAble device” concludes Matteo Benedusi “represents the first concrete example of innovation in the realm of Service 4.0 and the start of a new adventure as fascinating as it is challenging”. ●

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St. Croix TISSUE

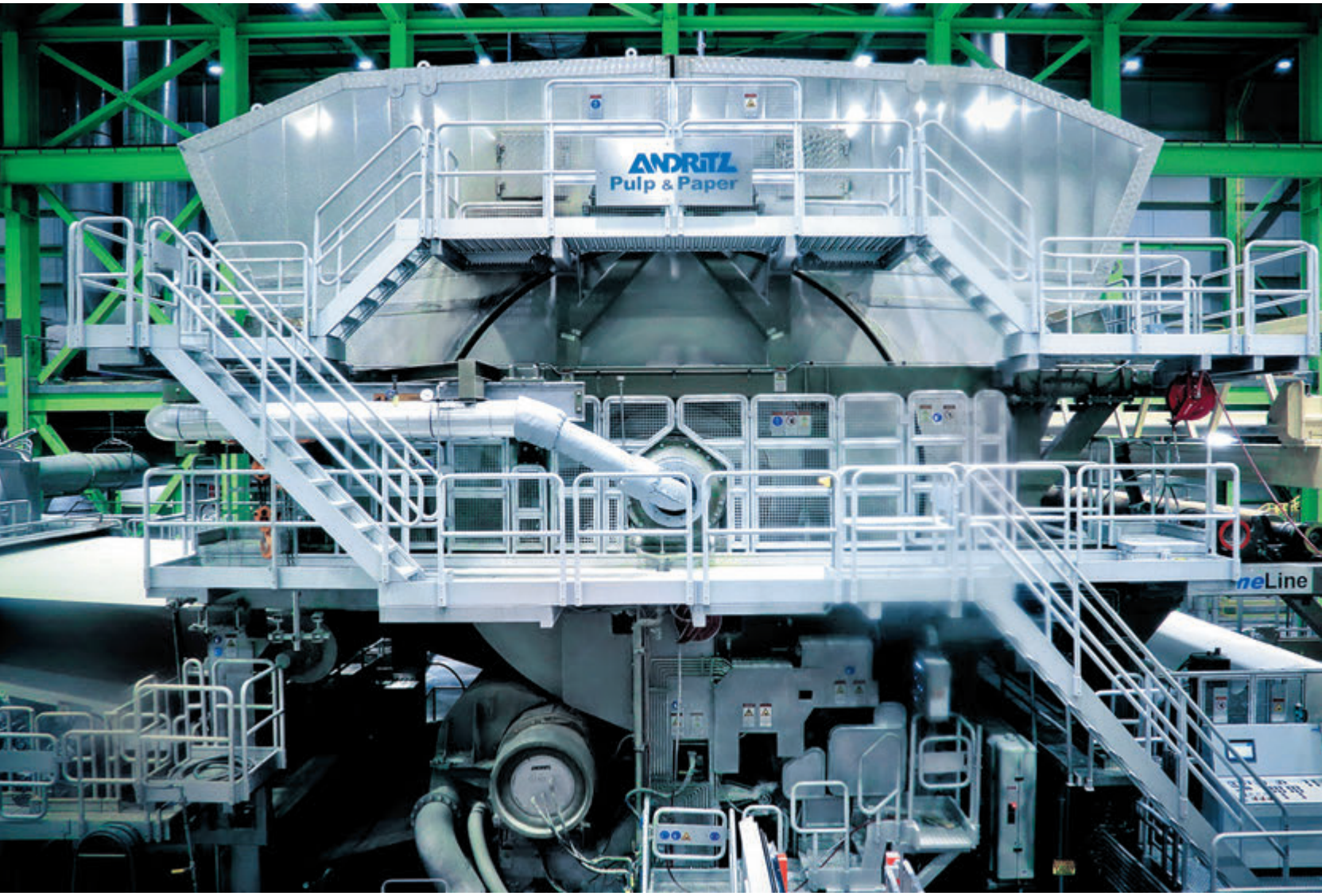
The strong newcomer in US tissue business

Two decades ago, the Woodland mill in Maine was a vibrant pulp and paper complex. Suffering the fate of many commodity pulp and fine paper mills, Woodland was near extinction in 2010 when a company with a vision bought the assets, injected USD 200 million (EUR 170 million), and changed the course to value-added tissue production.

by: TissueMAG

St. Croix Tissue is among the newest producers of premium tissue parent rolls in North America. The machine hall is built next to the existing hardwood pulp mill Woodland Pulp. Mirror-image ANDRITZ PrimeLine tissue machines, which started up in 2016, are quickly ramping up to a combined design production of 126,000 t/a.

"Without question, the addition of tissue making capabilities saved this pulp mill," says **Arvind K. Agarwal**, CEO of International Grand Investment Corp. (IGIC), the parent company of Woodland Pulp, St. Croix Tissue, and Cascade Pacific Pulp mill in Halsey, Oregon. "Just prior to our buying Woodland in 2010, the owner (Domtar) put the mill into indefinite shutdown."



▲ St. Croix specified a large Steel Yankee (18-foot diameter) for both machines. TM1 started up in March and TM2 in July 2016.

Rebirth

The rebirth of the mill has special meaning to **Marty Richard**, Tissue Manager. Richard was raised in the local community and worked at the mill for 16 years. "We saw some tough times and it looked like the end was near," Richard says. "In the late 1980s, there were 1,200 people working in the pulp, paper, and OSB (oriented strand board) plants around here. Before IGIC came in there were about 320 people in the pulp mill left. To come full circle where we are investing and hiring - for a mill that has a bright future - is really rewarding to be part of."

Setting the stage

"When we acquired Woodland in 2010, we already had the idea to maximize our return by adding tissue making capacity," says Agarwal. "My job was to turn this facility around by converting it from a commodity producer to a value-added facility." Agarwal and his team went to work immediately. "First thing," Agarwal says, "was to reduce our dependence on oil by bringing natural gas to the mill. Local distribution companies said it would take several years to permit and build a pipeline. We did it in 10 months with an investment of UDS 17 million. That was a positive indicator to the employees and community that we meant business." "There were also investments to improve the reliability and throughput of the kraft mill," says **Marco L'Italien**, Vice President. These investments set the stage for the announcement in 2013 that a new tissue mill would be built.

Excellent runability and smoothness

"Every converter, who has run our tissue, likes it," L'Italien says. "One converter was able to raise speeds by 70% due to the runability of our product." St. Croix considered investing in structured tissue, but decided to go with the CrescentFormer. "Even though our tissue is not structured, it is of very high quality," Richard says. "In some cases, it has allowed us to get a foot in the door in traditional structured markets. The formation on the CrescentFormer is just so good that we can compete well in the softness for the higher end bath tissues."

"Before we started up, I was concerned about physical quality of the reels, since we would be making 88-inch (2,235 mm) diameter rolls," L'Italien says. "My concerns were unfounded. These machines make nice flat rolls with excellent profiles. Whatever ANDRITZ is doing with its reel building technology certainly is working."

Proven supplier

According to **Tom Dorsch**, Project Leader for St. Croix, "We went through a very detailed process to develop the specs for this mill, and ANDRITZ was able to fulfill all the requirements of our spec." Of importance was a spec for a steel Yankee, instead of cast iron, because of the heat transfer advantages and safety factors. St. Croix specified 18-foot diameter Yankees instead of the standard 16-foot ones.

"The larger Yankees were a good choice," L'Italien says. "We don't have nuisance breaks since we have eliminated the steambox and simplified the machine."

Another consideration was machine width. "To meet the needs of one of our key customers," Richard says, "we needed a machine that would give us roll widths from the standard 102 inches (2,591 mm) up to 112 inches (2,845 mm). Not too many tissue manufacturers have this capability on-machine."

"We have come to appreciate ANDRITZ's contribution not only for their up-front engineering, but also for their understanding of the entire process," Agarwal says. "They have been an excellent partner the entire time - from the initial design to optimization of the mill. They have also kept in the forefront of technology, ahead of their competitors."

Building the vision

The contract with ANDRITZ was signed in January 2014. Groundbreaking for the new mill occurred in October 2014. "We had one of Maine's harshest winters," Dorsch recalls. "This at the time we were doing the deep foundation work. There were challenges to be sure, but all of the suppliers, including ANDRITZ, stepped up to help us recover schedule." For the Baileyville area this was a massive construction project. "Logistics was one of our biggest challenges given our remote location," Dorsch says. "It is 35 miles to a deep water port, 90 miles to the closest airport, and highway access is by two-lane roads. We had over one million construction hours involving 525 people on-site at our peak in the middle of winter."

▼ St. Croix Tissue produces 88-inch (2,235 mm) diameter rolls.

Multi-national machine

About 85% of the machine components were manufactured at ANDRITZ's facility in Foshan, China. The Steel Yankees were fabricated in ANDRITZ's state-of-the-art workshop in Hungary. Headbox, press rolls, and hydraulic systems came from Europe and the air systems came from Canada. "Like many North Americans, I wondered what the quality of the components manufactured in China would be," Richard says. "I went to the ANDRITZ workshop in Foshan to inspect the first machine. It was clear that quality was the first thing on the minds of the people – we didn't even have to ask the question before management was explaining their QA/QC processes. It was impressive. After delivery, we could see that the workmanship was really excellent."

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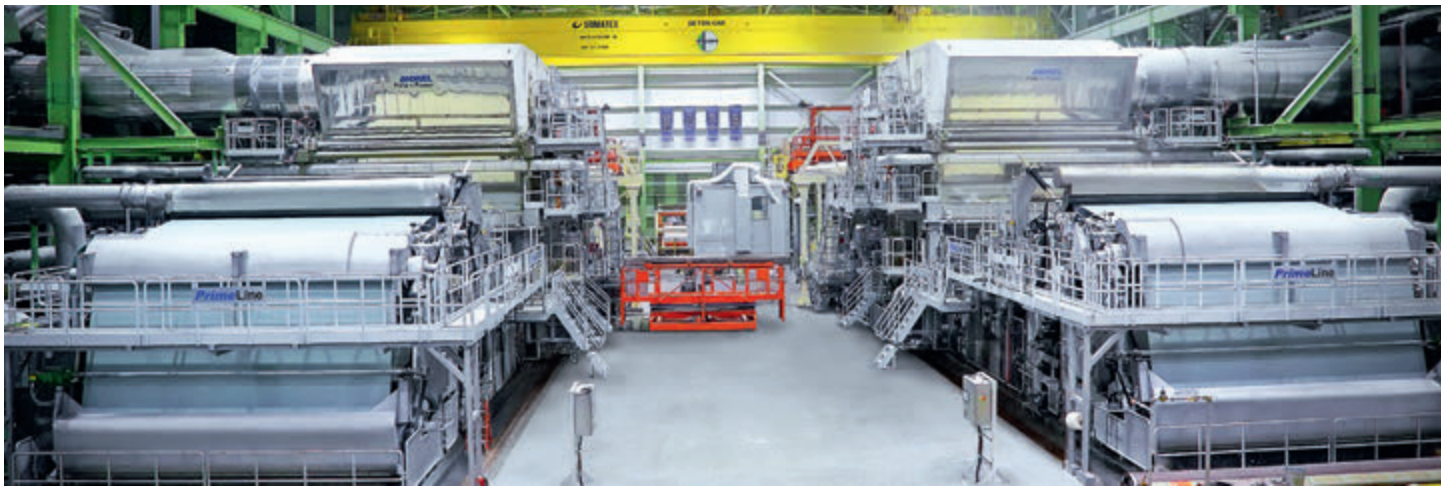
Precision all round



▲ The ANDRITZ tissue machines at St. Croix.

Successful start-ups

On the equipment side, ANDRITZ delivered the first machine in May and the second one in August 2015. "We began commissioning TM1 in January 2016," says **John Schamell**, ANDRITZ's North American Vice President for tissue and drying. "Even though construction was proceeding around us, we checked the machine out section by section. It was a little hectic and the operators were brand new. But, we got stock on the wire in early March."

> "The formation on the CrescentFormer is just so good that we can compete well in the softness for the higher end bath tissues"

The second machine was commissioned and started up with a more traditional approach and pace. "It started up well," says Schamell, "even though we had fewer resources since TM1 was in full operation by then, we had a good start-up in July 2016."

"In our first full month of operation with both machines, we reached 70% of saleable design capacity for this mill," Dorsch says. "I think that's a pretty fast ramp-up." When asked about the working relationship with ANDRITZ, Dorsch comments, "Whenever there were issues, ANDRITZ took ownership. Any problem got fixed and got fixed well. They were very open and transparent. They were always sensitive to timing, costs, and the impact on our operations. They are an excellent partner that way." ●

ANDRITZ AG
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Local training partnership

"ANDRITZ committed a very good team to this project, and they integrated well with our group," Dorsch says. "This is the third machine-pair start-up I have worked on and I can say that this project had more vendor support than I have typically seen. But, it was essential here given that our workforce was green with very little tissue experience." St. Croix partnered with the local community college to design a training program so potential job candidates could learn something about tissue making. Completing the program did not guarantee a job, only the opportunity for an interview. "Then in August 2015 we hired the initial team of 58 employees," Richard says. "The community college again partnered with us for a four-month training program. Much of this training was conducted by suppliers, including ANDRITZ." Part of the funding for this project comes through a New Market tax credit program. A requirement for that credit is that St. Croix hire 60% of its new employees from a lowincome bracket and maintain that ratio for seven years.

"This has a huge benefit for the community," L'Italien says.

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VILLFORTH
Siebtechnik GmbH

Cost savings by using forming fabrics made by Villforth.

Quality fabrics are **100%** made in Germany

TissueMAG: Mr. Villforth, please describe the structure of your Company in a few sentences.

Thomas Villforth: The Company is 100% family owned, now in the 4th generation. The relatively small size of the Company allows us to make fast and non-bureaucratic decisions and implement them straight away. My wife Karin and I make up the management of Villforth Siebtechnik GmbH. We have an experienced and innovative team with specialists in textile and paper technology. Our personnel planning is always long term and the fluctuation rate is close to zero.
The vacant positions are advertised internally at first and relatives and friends of the workforce can be considered. We have some families who have been working here for several generations - such things create a good working climate.

TissueMAG: How has the past financial year been and what is your forecast for 2017?

Thomas Villforth: Last year ended with a new record turnover, which obviously makes us very happy and proud. The ultra modern weaving machine from Jürgens, which was purchased in 2015, contributed significantly to this development. It runs at maximum capacity and produces fabrics of unbeatable quality. For 2017, we have set very high targets again. The year began with a major reconstruction at the outset. We look confidently into the future.

TissueMAG: How do your products different from those of your international competitors?

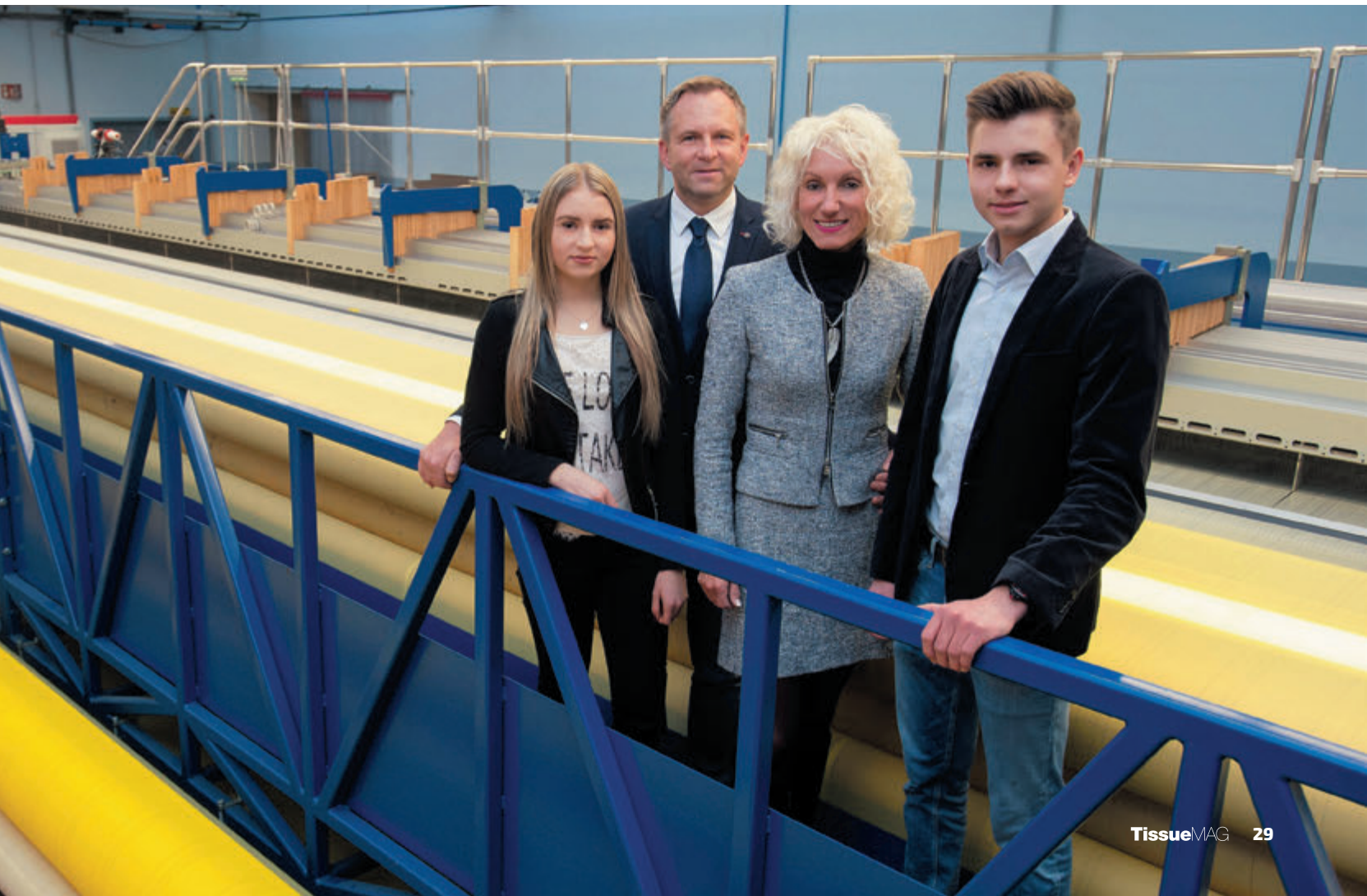
Thomas Villforth: All our products are manufactured at our location in Reutlingen, South West Germany. The maintenance of

▶ Karin and Thomas Villforth with their kids Sissi and Lukas at the modern high-speed loom JP-5000 of the company Jürgens.

▲ Factory building of Villforth Siebtechnik in Reutlingen (Germany).

Every papermaker recognises the need to increase the efficiency in all parts of the paper production process. This means cost savings without any corresponding drop in quality. In the following interview with TissueMAG, Thomas Villforth, managing director of the German forming fabric manufacturer Villforth Siebtechnik GmbH, explains the influence of the correct choice of forming fabric on cost savings.

by: TissueMAG



Talking to...

Thomas Villforth (born in 1964 in Reutlingen) joined the company as managing partner in 1999. In his first 10 years at Villforth Siebtechnik, he learned the secrets of fabric manufacturing from his father Peter Villforth. He always stresses how glad he is that he was able to learn from his father's wealth of experience. When Peter Villforth died in 2009, Thomas Villforth became the company's sole shareholder. The man from Reutlingen has found his professional home in the paper industry: after graduating as qualified paper engineer from TU Darmstadt in 1992, he held senior positions in the paper mills Haindl Papier (now UPM) in Augsburg and Scheufelen in Oberlenningen.
Since 2000 he has lead the Zellcheming district group Baden-Württemberg. In 2014 he was appointed chairman of APV Darmstadt.

our location is important for us in order to guarantee the highest quality standards. We provide tailor-made products according to customer requirements. Compared to our competitors, we are a relatively small but very flexible Company, which specializes in the production of high quality forming fabrics. In order to remain competitive we are dependent on new and on-going development of our products. Our research and development team works in the laboratory at full pace. At present, we are particularly proud of a newly developed technique to produce the seam for TAD fabrics. The finished seam is so tough that we are currently surpassing one lifetime record after another with this product.

TissueMAG: The energy costs for the forming section are comparatively low, why is it worth taking a closer look at it?

Thomas Villforth: At first glance, the wire section does not appear to play a major role when it comes to saving energy for papermaking. After all, it only accounts for about 15% of the energy demand. Upon closer inspection however the following becomes apparent: sheet formation has a big influence on drying - and this drying process takes up to 65% of the total energy demand! By optimising the wet end and increasing dry content, there is enormous potential for improving energy efficiency.
For an optimal result, it is important to ensure that the drainage curve is uniform and to achieve that the suction boxes, for example, must be configured accordingly. Our paper service engineers work with customers to create and evaluate dewatering processes as well as carrying out other optimizations of production processes in the wire section.

TissueMAG: Where do you see further strengths of your forming fabrics and the associated cost savings for your customers?

Thomas Villforth: Many of our customers praise our fabrics for their ease of cleaning. This means both less downtime and a reduction in the quantity of chemicals used, which results in great cost savings. To guarantee even easier fabric cleaning you can request your forming fabrics with our Topaz© coating. The coating

consists of a low viscosity multi-component resin. It is applied to the whole fabric, sintered at high temperature and covers all the yarns as well as the cross-over points. This prevents any contaminants or fibre sticking, which is of great importance for waste paper furnish. Furthermore it leads to a significant reduction in energy consumption due to the lighter running of wires over the dewatering elements. Another argument is the approximately 30% better dimensional stability in both CD & MD. Topaz© coating is set for the entire life of the fabric and is resistant to all chemical cleaning agents as well as the use of high pressure showers. Villforth fabrics stand for superior quality. This starts with the purchase of the PET, PA yarns or the newly developed VEXTREME© yarn. We buy all PET and PA yarns from high quality German manufacturers. The raw materials are consistently checked for their quality, as this is the only way to ensure the long lifetime of our fabrics on customers' machines.

TissueMAG: What is behind the name VEXTREME©?

Thomas Villforth: The newly developed VEXTREME© yarn combines the advantages of polyester and polyamide. Until now, the wear on the fabrics has been countered by alternately weaving abrasion resistant polyamide (PA) and polyester (PET) yarns on the machine side of the fabric. The polyamide does prevent abrasion, but it absorbs water and therefore over time swells up, which can cause fabric edge curl. Another disadvantage is that the tensile values of polyamide are too low, so that a fabric made from 100% polyamide would be as elastic as a rubber band. Polyester on the other hand is a stronger material and absorbs no water, but its abrasion resistance is poor.
The new development VEXTREME© is dimensionally stable and at the same time resistant to abrasion. As a result, VEXTREME© yarns can be used up to 100% on the machine side of the fabric, whereby it forms a monoplane surface. The VEXTREME© yarn reduces frictional loss to a minimum and thus lowers the drive power.

TissueMAG: What are your mid/and long-term business plans?

Thomas Villforth: We want to steadily expand our market position through a mix of proven quality and newly developed products. We have some very promising development projects which are close to completion. My son is already successfully involved in this area. Quality and customer satisfaction are always the top priority. Our corporate and financial policies are quite conservative. They are characterized by moderate growth and a high equity ratio. Therefore, the Company is well equipped for the future and can go forward positively into the 5th generation. ●

TissueMAG: Mr. Villforth, thank you very much for the interview.

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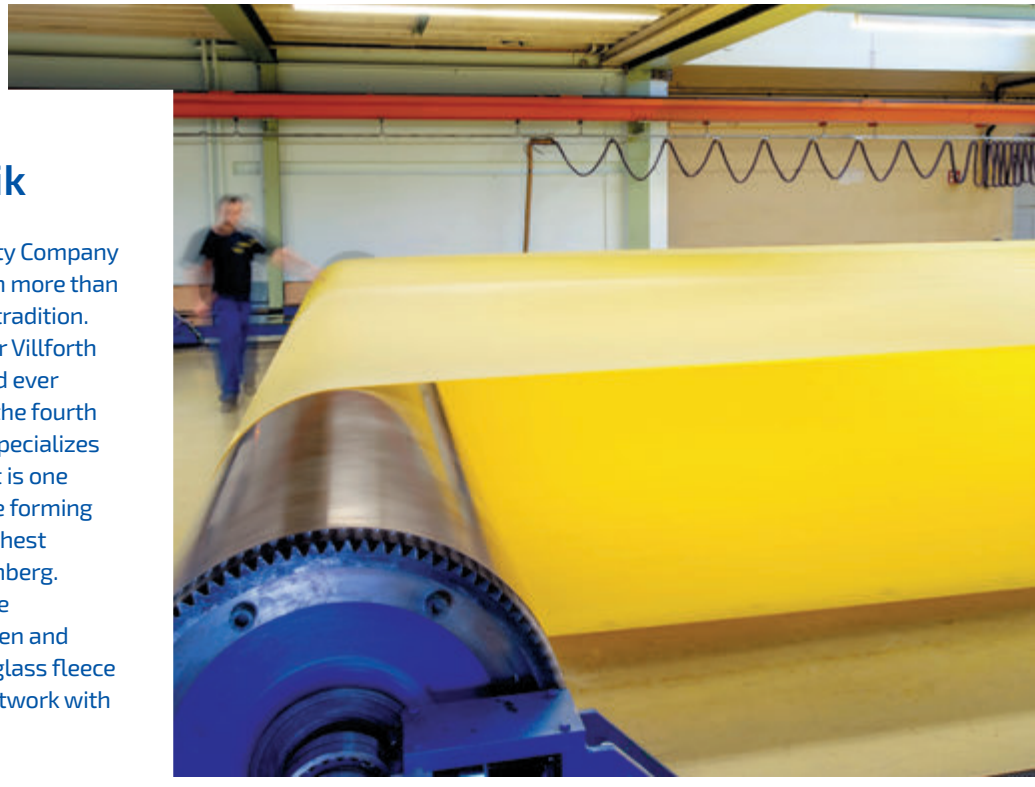
phone: +49 (0)71 219490 - **email:** info@villforth.com
website: www.villforth.com
contact person: Thomas Villforth

▶ The dimensional stability of the fabrics is increased in the outlet.



About Villforth Siebtechnik

Villforth Siebtechnik GmbH is a limited liability Company based in Reutlingen, which can look back on more than one hundred years of successful company tradition. Founded as Vereinigte Metalltuchfabriken by Peter Villforth sr, the company has remained 100% family-owned ever since: Mr. and Ms. Thomas and Karin Villforth are the fourth generation running the company today. Villforth specializes in the manufacture and sale of synthetic fabrics. It is one of the market leaders in the area of paper machine forming fabrics – all of them are made according to the highest quality standards in Reutlingen in Baden-Württemberg. Villforth's customers can also be found outside the paper industry today – for example in the nonwoven and fibreboard, food, particle board, leather fibre and glass fleece sectors. The Company has a global distribution network with sales representatives in more than 25 countries.

The A.Celli Paper Headquarters.

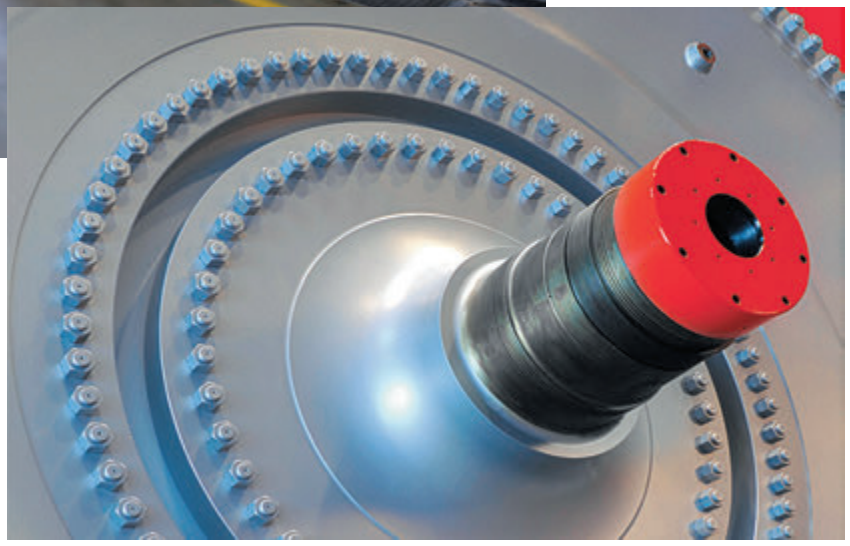
A.Celli Group: supplying technology, innovations and complete services to the tissue, flat papers and cardboard and nonwovens markets

A.Celli Paper and A.Celli Nonwovens are two internationally renowned companies headquartered in Lucca that have been present in the global paper and nonwovens markets with top-range technological solutions for over 70 years. by: TissueMAG

▲ A turnkey tissue plant.

In 2003, cousins **Mauro Celli** and **Alessandro Celli** - who today serve as presidents of the two companies - decided to restructure the family company founded by Alvaro Celli in 1944. The idea was to create two specific companies - A.Celli Paper S.p.A. and A.Celli Nonwovens S.p.A., the first dedicated to tissue, flat papers and cardboard and the second to nonwovens. A continuous growth that set the foundations for the creation of the A.Celli Group, opening the way to major development in terms of visibility and results for both business areas.

◀ E-WIND tissue rewinder.



▼ A Steel Yankee Dryer.

The Group's strategy was to transition from a culture entirely focused on mechanical production to one focused on being a centre of excellence and expertise, aimed at ensuring customers the best results in terms of performance, innovation, quality and optimisation of investments. And all based on the establishment of long-term relationships and partnerships and intense R&D activities. The A.Celli companies are consistently dedicated to anticipating customers' needs, differentiating themselves for being flexible, young and dynamic companies, and for the high degree of design automation of its machinery. It is important to underscore the attention placed on the "baby-sitting" phase during machine installation, designed to offer qualified and specialized support to the customer from start-up all the way to the exit of the finished product from the machine.
In addition to its Italian offices, the A.Celli Group is present in Istanbul, Turkey (A.Celli Turkey), in Asia, with a division in Shanghai, China (A.Celli Shanghai Machinery Co. Ltd.), and in the Americas, in Concord, NC, USA (A.Celli International Inc.).
Covered surface area: the A.Celli Group, with its two production facilities in Tassignano and Rughi (Lucca - Italy), totals an overall covered surface area of 25,000 m^2.
Number of employees: the A.Celli Group counts a staff of over 225 people.
Turnover: overall turnover for A.Celli Paper S.p.A. and A.Celli Nonwovens S.p.A. is 100 million Euro, with an export figure of over 95% in about 46 countries all over the world.

> "With A.Celli Paper, the customer is assisted in every project: step by step, side by side"

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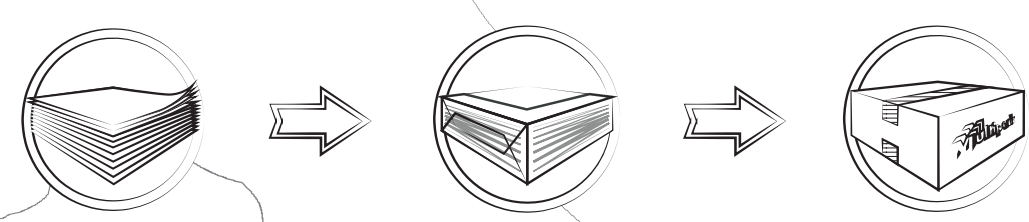
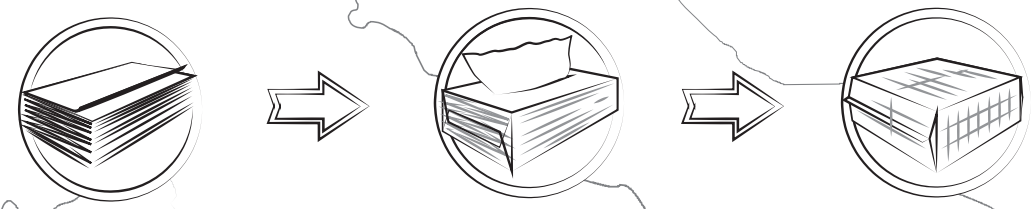


TABLE NAPKINS



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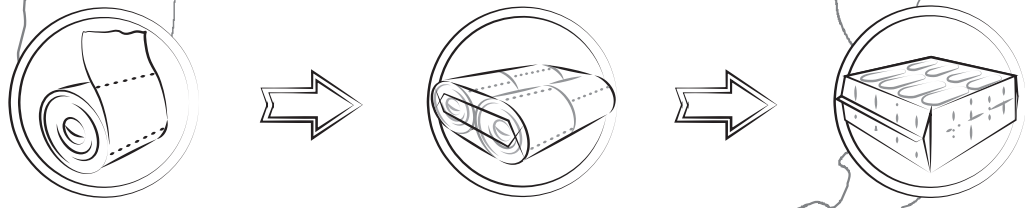

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A.Celli Paper

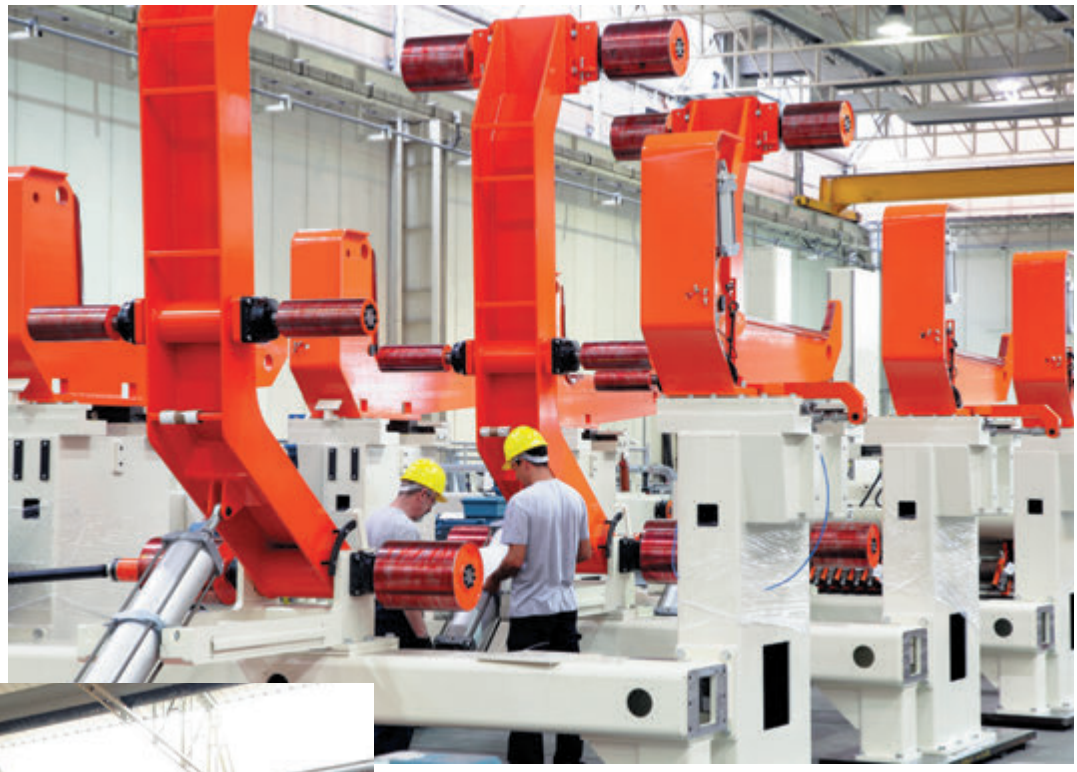
A.Celli Paper S.p.A., whose CEO is **Mario Fazzi**, is specialized in technologically advanced system solutions for complete turnkey plants, in the manufacture and rebuilding of Tissue Paper Machines with a daily production capacity from 30 to 260 tonnes, rewinders for tissue and flat papers and cardboard and roll handling with a flexible packaging systens to adapt and be integrated into different production capability. The innovative MySp@res® system and the 24/7 post-sales assistance service complete A.Celli's offer.

The A.Celli Paper, leaving behind a culture oriented only towards mechanical production in order to successfully become an evolved technical hub whose main goal is to guarantee its customers the best results in terms of performance, innovation, quality and optimization of investments. Focusing on long-term partnerships and on an intense R&D activity, the Group is today a global reference in its fields. And as a solid demonstration of this commitment, the Group's R&D department has recently developed a new patent for the Steel Yankee: a new manufacturing technology allows the entire shell to be forged from a single piece of steel with no welds, and it can be used for all diameters on a single wire (3m), while for twin-wire (6m) only the circumferential weld is necessary.

The elimination of welds sensibly reduces mechanical issues while at the same time guaranteeing greater solidity and improved heat transmission.

The A.Celli Group global presence counts 979 installed units, among which 74 tissue machines - 9 of which are turn-key projects - 183 tissue and paper rewinders and 75 handling systems. ●

> "Four facilities worldwide for a global coverage"



▲ Tissue rewinder pre-assembly.

◀ Tissue machine pre-assembly.

A.Celli Paper S.p.A.
Via del Rogio 17 55012 Tassignano (LU) - Italy
phone: +39 0583 98441 - **email:** info@acellipaper.com
website: www.acelli.it

Established in
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Systems Installed
523

Countries where we are present
53

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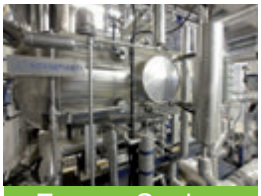

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Gambini introduces Hammerless, and reconfirms as a leader in flexibility and performances

Since 1870 Gambini family has renovated and innovated, carrying out a process of technological development which has now reached full awareness.

by: TissueMAG

Gambini Headquarters, Lucca, Italy.

The company researches, designs and manufactures technologically advanced machinery for the converting and the production of tissue products for hygiene and personal care, both for the Consumer and for the Professional sector.
Its complete offer expresses the achievement of the concept of Perflexion, which is the combination of flexibility and performance, which is reflected in the composition of its lines and in their modularity to adapt to different production needs, guaranteeing thus high levels of operating efficiency.
TissueMAG made a journey into the industrial philosophy of Gambini S.p.A. in the company of Sales and Marketing Director Carlo Berti and found out that the focus on innovation, which has lasted for almost 150 years, is the result of an incessant search of flexibility and performance that goes beyond the production process and that over the years has become a real mindset. Hammerless, the new ply-bonding system that allows to join two plies without mechanical bonding is yet another proof of it.

TissueMAG: Dr. Berti, at Gambini over the last years, especially with the birth of TMax, we have witnessed a technological acceleration in terms of embossing, where you are the leader. How does the new Hammerless system fit in this relentless innovation process?

TMax represents the highest point of development of all the concepts of efficiency, the ready to use and interchangeability that Gambini has brought in the tissue sector over the years. Its excellent versatility is in some way a mirror of the versatility of our R&D, which for years has looked for cutting-edge solutions that can adapt to every need. Our

> “Gambini is focused on innovation, research, flexibility and performance”

mission is to innovate, creating thus value for the customer. To achieve this goal it is essential to be totally flexible: flexibility can actually represent a value itself, since it leads to pay attention to the other, which may mean satisfying the market demands or listening to the customer needs. Being open to discussion leads to an equal partnership, a participation made of respect and proactivity that makes things happen. Hammerless was created by our technicians as a reply to a request from one of our customers. There was the necessity of keeping together two smooth plies without complicating the line with other machine parts: therefore, we decided to design a new ply-bonding system that involves only the embosser.

TissueMAG: Do you think that the need of your customer from whom the idea of Hammerless was created may be a need shared by others?

When we find a way to simplify a manufacturing process and to increase quality and efficiency while reducing the production costs, there is no customer who is not interested. The mechanical coupling is of course still a valid system, which however requires a lot of maintenance. Try to imagine a line that can keep together two plies without adding any other machine part, simply using what is already there, such as the embosser. Only because it eliminates a machine part, it allows also to eliminate all the difficulties that inevitably go along with it. The mechanical ply-bonding system is noisy, easily worn out, and it requires a constant maintenance just to realign the wheels, resulting in a waste of time and money. The idea of using the existing embosser and without modifications, not to emboss but only to laminate, using a small amount of glue, has been a real revolution.

▼ Carlo Berti, Gambini Sales & Marketing Director.

TissueMAG: To summarize, which are the real benefits of the new ply-bonding system Hammerless?

More quality of the product, in less time, with less maintenance, less mechanical parts to be added to the line and, therefore, less costs. We have reduced the complexity to increase the benefits. With Hammerless there are no consumable parts, which are instead many with the mechanical ply-bonding system, where it is necessary to replace not only the wheels but also the counter-roll. As you know, the machines must stop to change any mechanical part, and the cost which impacts more for each manufacturer is exactly the downtime.
Add to this that with our type of ply-bonding it is possible to carry out simultaneously an operation of coloration and perfumetion of the product, operation which is not achievable with the standard mechanical ply-bonding system. Hammerless is a system that could prove to be very useful for the away from home market and for all the products for the community, where the mechanical coupling is usually widely used.

▲ Gambini consumer line Flex700.

TissueMAG: How was the idea of the campaign "Save the Tissue" born?

When we tried to give a name to the new coupling system, we focused on the benefits that ply-bonding could bring to the paper, and that the standard mechanical ply-bonding could not achieve, instead: the main benefit was keeping the plies together without hitting them, hence the name hammerless. This lack of mechanical "hits" made us think of a campaign which could be a bit ironic, against the mistreatment of the tissue. With Hammerless the paper is not embossed and even not ply-bonded, therefore there is really no kind of abuse of the two plies, which are kept together, so to speak, without constraint.

TissueMAG: Can we say that innovation for Gambini is played mainly on the embossing?

Let's start by saying that we are the number ones in the area of embossing. In the converting area there are two strategic machines: the rewinder, that wraps the paper on the core and makes the log, and the embosser. Gambini has shifted the focus of the world of Tissue from the rewinder to the embosser thanks to TMax, and the market has proved us right. The final consumer tends to choose the roll for its softness, strength, absorbency and in general for the quality of the paper, characteristics that have to do with the embossing and the lamination. That's exactly where we focused all of our innovative energy, on a process where we are leaders and that can really make the difference on the finished product. I can reveal you in advance that the news for Gambini, in fact, do not end with Hammerless. Soon the TMax family will expand, increasing our visibility on the market, always in the light of Perflexion philosophy, in order to share with many more customers flexibility and performance. ●

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phone: + 39 0583 277611 - **email:** info@gambinispa.it
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Pulsar ENGINEERING

Automated systems
Tissue converting

dedicated to the industry

Pulsar, a well-known Bolognaise company specialized in the supply of complete systems, automatic machines, management and quality control systems for the tissue industry, is glad to announce the important changes that took place inside its organization.

by: TissueMAG

▲ Pulsar Engineering headquarter and staff.

◀ Overall view of a complete line.

Since January 1st, 2017, the Pulsar Group has modified its organizational structure, as a result of the strategic development plans which was started in 2012. Further to this change, Pulsar srl becomes the mother company of a Group composed by 2 other companies, which are 100% owned by Pulsar Srl - these are their missions:

- **PULSAR srl** is the parent company, in charge of the capital management of the Group assets, patents, know-how and with the mission of controlling and leading the operative subsidiaries.
- **PULSAR ENGINEERING srl**, established in 2006, has become the operating company starting from January 1st, 2017 - it is in charge of all activities, from sales and marketing to technical activities, product development, production and after-sales management, relying on Pulsar Srl employees now transferred under the new company. In this function, the Company Pulsar Engineering srl manages the formal activities connected to all relationships and transactions with all external parties, taking over the prerogatives that have been in charge to Pulsar srl until 2016.
- **PULSAR AMERICA Inc**, based in Green Bay (WI), United States, established in 2013, has the mission of managing sales and after-sales activities for the North American market, providing both technical assistance and spare parts service.

The evolution of the Group in the recent years is the result of a precise development strategy that has focused on the international Tissue industry as core business and main target industry to offer a package of innovative services and products for the recovery of production lines efficiency, going beyond the conventional products, such as conveying lines and automatic machines.

In this company development process, Pulsar Engineering will aim at strengthening what Pulsar

> “Complete systems, automatic machines, management and quality control systems for the tissue industry”

has been creating since 1989, bringing forward studies to improve lines production management to achieve the ideal combination of hardware and software to manage and optimize complete lines, integrating machines and conveying systems.
In recent years Pulsar has engineered several automated systems dedicated to the Tissue converting industry, which help to improve the management of production lines, the compliance of products to quality standards and the increase of the overall converting line efficiency. The results of such activity are Pulsar's product families "Quatis" and "REDS Harmonizing Systems".

Quatis Machines

With the aim of providing a solution to the non-conformity issues of Tissue products, Pulsar has engineered and marketed the Quatis machines family. These are machines conceived for the quality control both of unwrapped products (such as toilet/kitchen/industrial rolls and folded products) and of wrapped products, (such packs and bags of toilet/kitchen/industrial rolls and folded products). The Quatis innovative technology relies on powerful vision systems and complex algorithms for image analysis that allow the inspection of each product according to preset parameters and single user requirements. By controlling each product, the machine provides elaborate analysis of the frequency and causes of non-compliances, giving the opportunity of adequately improving the settings of the machines upstream thus increasing the line efficiency and consequently the overall production capacity.

REDS Harmonizer Software Packages

These systems, developed inside the product family "**REDS Harmonizing Systems**", monitor and control the way in which each machine works inside the Tissue converting line, from the rewinder to the palletizer. Being these machines supplied by different manufacturers, the only interaction possible is a basic communication, without the exchange of more complex information on each machine status. To fill this gap Pulsar has developed its **'Reds Harmonizer System' software package**, which has the purpose of establishing:

- the communication between machines within a Tissue converting line;
- the management of different communication protocols up to the integration with an OPC server;
- the organization of dynamic memory areas where the CPUs of the connected machines can read the data of the other machines and provide their own data to the system;
- the best optimization strategy for machines;
- the ability to save any processing event as an optimized working recipe, which becomes in time an essential tool to tissue manufacturers for the setting of their machines.

Moreover, Pulsar has recently developed a platform for SCADA systems, specifically engineered for the calculation of the OEE (Overall Equipment Effectiveness) in the Tissue converting industry. ●

▲ Quatis for wrapped products.

▶ Quatis for unwrapped products.

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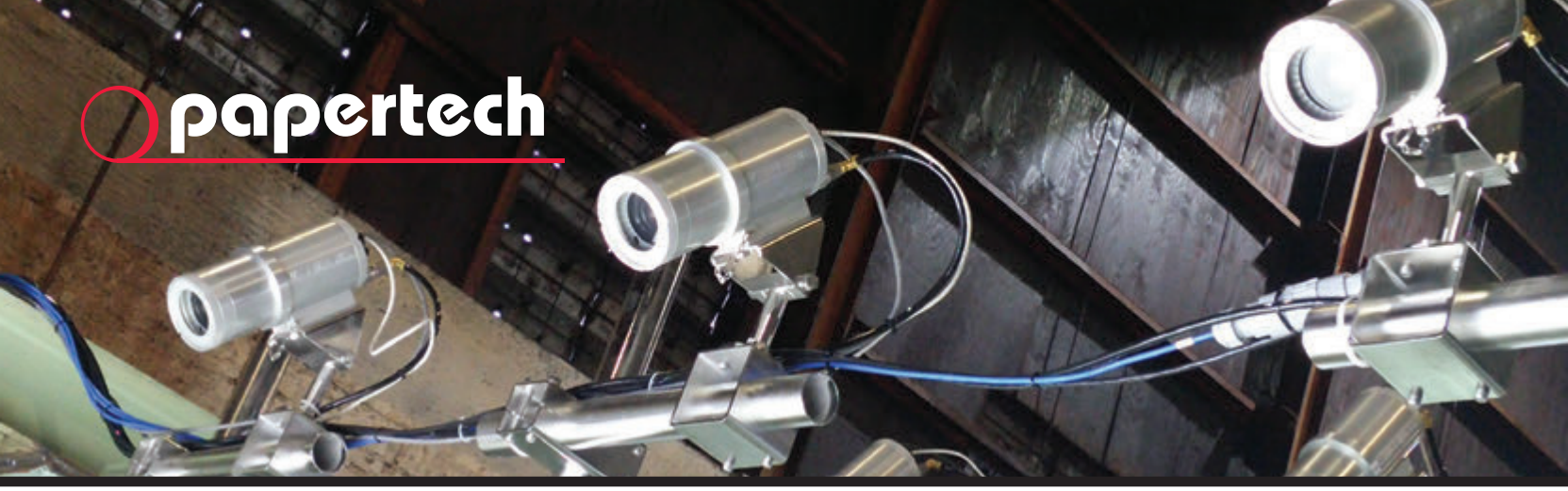

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Minimized web breaks and **increased production capacity** after the rebuild of Hayat TM1

▲ The rebuild scope included Valmet's Advantage technology including the brand new AirCap Helical hood, the ViscoNip press, Cogeneration layout, web stabilizer and dust removal system.

Hayat TM1 had been running at the Izmit mill in Turkey for nine years with high efficiency. But the machine also had some weak parts related to the hood and press section. Also the Cogeneraton system needed an upgrade.

by: TissueMAG

To improve production capacity, runnability and energy efficiency they decided to upgrade the machine to the Advantage DCT technology, in line with their other five tissue machines. It was a major rebuild project and a big challenge as it had to be finalized within five weeks. But with thorough planning and systematic work it was finalized in time and the result even exceeded their expectations.

Web breaks are more or less a memory

Summarizing the rebuild of TM1 in Izmit, fulfilled the targets and gave some surprises too. Pretty soon after the start-up they realized that the web breaks are remarkably low, the production capacity increased significantly and the machine is easier to operate.

"Before the rebuild we had a production capacity of 8-9 tons per hour, now we can easily make 10-11 and sometimes even 12 tons per hour. But most remarkable was that the web breaks were more or less eliminated which in turn improved the machine speed" says **Lütfi Aydin**, Global Paper Group Director.

Today the moisture profiles are optimized and there is no need for a steambox anymore. The improved base paper properties have given effect also in converting machine which now runs at higher speed and with less stops. The drying energy savings are obvious.

"The flexibility in nip load makes it possible to get up to 6%

capacity increase with lower energy consumption or keep the same production as earlier with 16% less total energy. But we believe that the Advantage ViscoNip press is the main reason behind most of the improvements. It is indeed the new magic for tissue making" **Kemal Arslan**, Investment and Project Manager, concludes.

▲ Lütfi Aydin, Global Paper Group Director.

▲ Kemal Arslan, Investment and Project Manager.

Thorough planning the key for efficient project execution

To bring 100 persons together to work effectively in a narrow space is a big challenge. The time frame was set to 35 working days which turned out to be tough, but doable.

"A new installation is easy. A rebuild project, on the other hand, is a very big effort and the planning is difficult as 100 people are involved. All work were planned to be done during daytime. It was very difficult to foresee all kind of situations that can appear so we did many changes" tells Mr. Arslan.

> "I believe that the ViscoNip press is the new magic unit for tissue makers, a new standard for tissue machines"

Hayat Kimya has a systematic way to work with tissue machine installations, utilizing the same people and their experiences from previous projects. This turned out to be successful also in this project. Mr. Arslan continues: "We sent our machine operators to TM4 in Russia and TM5 in Mersin, Turkey to learn how to operate the ViscoNip technology, which was new to the people in Izmit. So when the machine started up they already knew how it worked and how to control it. They were also familiar with the mechanical and electrical maintenance, the system and the logics. That was a big advantage".

The project was finalized according to time schedule and once again the expectations were exceeded. "I was worried we had to spend a long time to reach the same runnability, but in two or three days we were running at the same level as before. That was a positive surprise, our team made a very good job together with Valmet" says Mr. Aydin.

Advantage ViscoNip - The magic device

During the years the mill team had put extra effort to continuously improve the press section. A steambox was installed to correct the profiles, tests were performed with various Yankee crowning, shell material, coatings and felts. But the profiling problems remained. At the same time they had great experiences of operating the Advantage ViscoNip press in Russia and Mersin which convinced them that it would also be the solution for TM1.

◀ The Hayat people are convinced that the Advantage ViscoNip press is the secret behind the improved runnability and production capacity.

> We have almost no paper breaks and the even dryness on the edges creates a lot of advantages

"I believe that the ViscoNip press is the new magic unit for tissue makers, a new standard for tissue machines. We have seen many improvements after the rebuild. The profiles are significantly better and have allowed us to increase the moisture level at the reel which has given 1-1,5% production increase. We have almost no paper breaks and the even dryness on the edges creates a lot of advantages", Mr. Arslan reveals.

...also improving converting efficiency

Several trials have been done with different nip load to test how different loads are affecting energy consumption and product quality. Energy savings up to 16% are common with high nip load while quality improvements like higher strength and surface softness can be achieved with lower load. But the ViscoNip also affect the converting side. One of the biggest challenges is to optimize the paper production for best quality and energy efficiency in converting side. Mr. Arslan continues: "We have seen a capacity increase of 5-8 percent in converting. One reason is the base paper, as better quality enhances the embossing and the converting machine can run at higher speeds. With high quality paper you can also run the machine with less stops. This also effects efficiency of course".

New Helical design of Advantage AirCap

The old Yankee hood was not in very good shape. It was mechanically instable and neither air circulation nor profile fulfilled the requirements. The new hood on the other hand has a brand new design where the headers are tilted in cross machine direction which allows very even drying profiles.

"To compare the results from the new hood with the old we tried to create the same conditions as we had in the old hood with same press load producing the same product and we found an increase of 7% in hood efficiency. Previously we had big temperature variations on the Yankee surface. The Helical hood has no such thing".

Cogen upgrade to familiar design

The upgrade of the web stabilizer, dust removal system and cogeneration system to Valmet design did not only improve general efficiency, it also save time.

Instead of dealing with problems the machine operators can now concentrate on running the machine, produce best quality paper and contribute to the total efficiency.

▲▼ The cogenerations system has been updated with Valmet logics and layout.

"The new cogeneration system makes it possible to generate steam even when the machine has stopped. It has also raised the exhaust temperature about 20 degrees which gave two extra tons of steam. We also save 70 tons of water as we need less fresh water for the boilers".

Hayat Kimya decided to enter the tissue business in 2004 and their first tissue machine started up at the Izmit mill in 2006. Two years later the production capacity hit the limit. At the same time the market demand was steadily growing. So TM1 was followed by TM2, an Advantage DCT tissue machine from Valmet and the company started to grow rapidly.

Today Hayat Kimya has six tissue machines in operation, in four countries, with an annual capacity of 420.000 tons of tissue paper and a capacity to convert 290.000 tons of consumer products. ●

Valmet Tissue Mills Business Unit
phone: +46 54 171000 - **email:** tissue.info@valmet.com
website: www.valmet.com

icP 1924

Cardboard for trouble-free cores

Giuseppe Pieretti was an old-fashioned entrepreneur: a sort of visionary and start-upper ante litteram. He established his own paper-making company in 1924, when he was less than thirty years old: in this very first plant of the Pieretti family, he used to produce straw paper. That factory was located exactly where, more than 90 years later, it still is: in Marlia, at the heart of the world-class Italian paper district of Lucca, in Tuscany.

by: TissueMAG

▲ Warehouse (interior).

◀ PM2 final section.

Nowadays *icP* - as *industria cartaria Pieretti* is called everywhere in the world - has shifted its production to more than one paper grade, which fit several industrial applications. Mainly, it's the tissue field the one served by *icP*: coreboard is the paper used to manufacture the tubes (cores) inside toilet paper and kitchen towel rolls. It is a specific kind of paperboard, with particular specifications and precise mechanical features: *icP* is able to produce around 150.000 tons of it each year, using exclusively waste paper. One-hundred percent of the material *industria cartaria Pieretti* starts from is recycled paper, collected by Italian municipalities and some selected industrial partners, who grant,

> "High-standard logistics, in order to let the customers be served when they need it"

▲ Pulping area.

▶ Co-generating plant.

through a direct ownership and control by the Pieretti family itself, the best raw material supply chain. In the last 25 years *icP* has gone through an expansion of its market, ranging from the Italian one - still the main selling area, accounting for about half the total turnover - to a global presence in more than 70 countries all over the world, with Europe, Middle East and Latin America being the main exporting destinations. *icP* is able to supply a sort of tailored product, suitable for the needs of the tissue industry: converters, glue manufacturers and machinery producers keep collaborating with *industria cartaria Pieretti*, in order to detect any critical point in the whole chain and develop a standard for the tissue field. As leaders in the production of coreboard, *icP* has also developed and improved an internal planning method which today enables to configure the product according to the exact clients' specifications: each processing parameter is flexible, so that the customer can choose the board which rightly addresses its own needs. This product configuration procedure *thinks ahead* in terms of production quality and is the representation of the company's commitment to its job: led by the fourth generation of the Pieretti family, more than 100 people now run two paper machines, making grey and white board, with a substance ranging from 130 to 400 g/m^2 and in a width spanning from 65 to 2,620 mm. One of the distinctive sides of the way *icP* manages its business - one *icP* is very proud of - is the care it puts in the environmental issue: in the last years a dedicated water-treatment plant and a co-generator have been built and activated, in order to save a lot of water and energy. *icP*'s goal is to lower more and more each year the consumption of natural gas and to reduce constantly the emissions of carbon dioxide. ●

> "Complete control over the entire process, starting from the raw material"

icP / industria cartaria Pieretti S.P.A.
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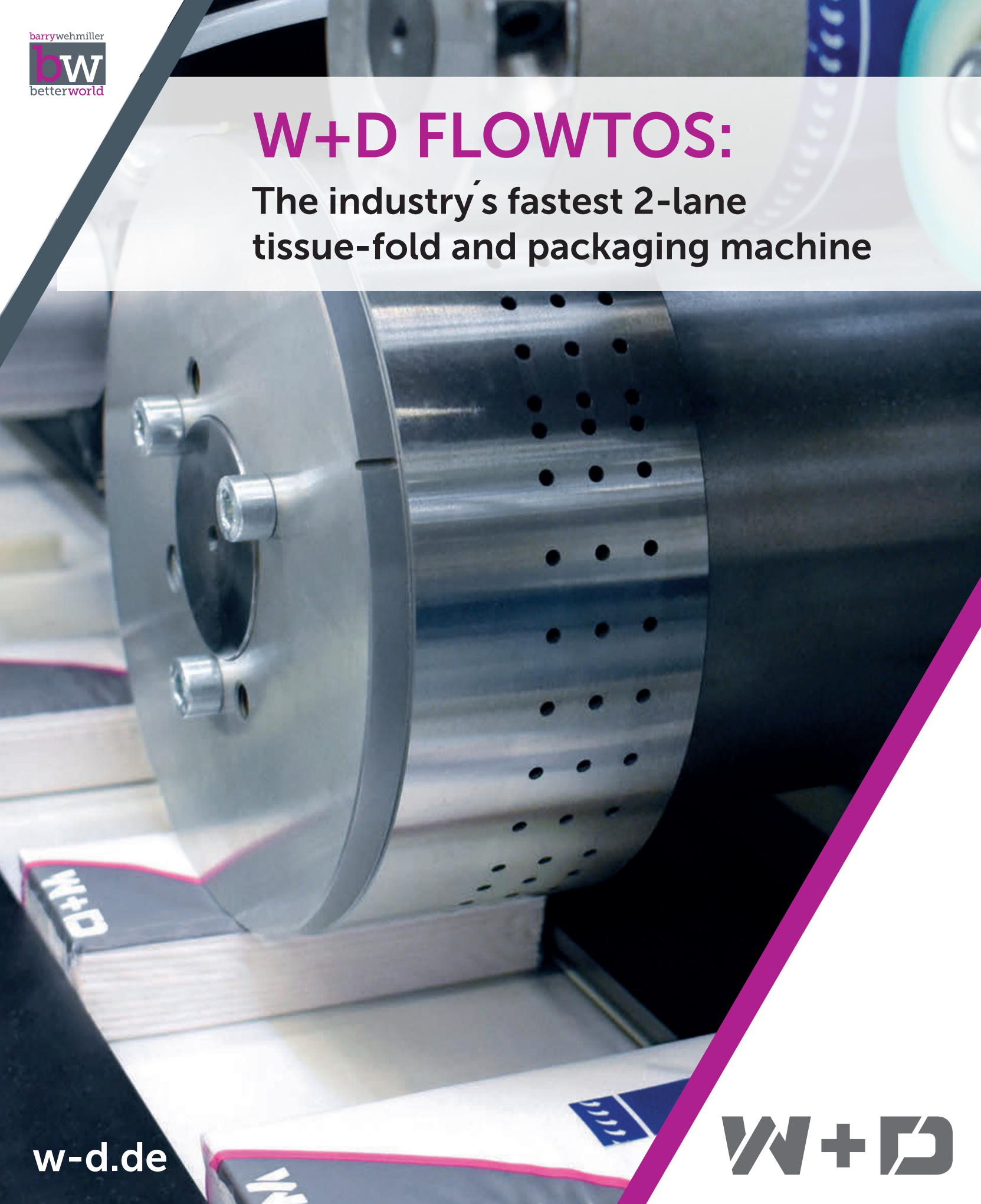

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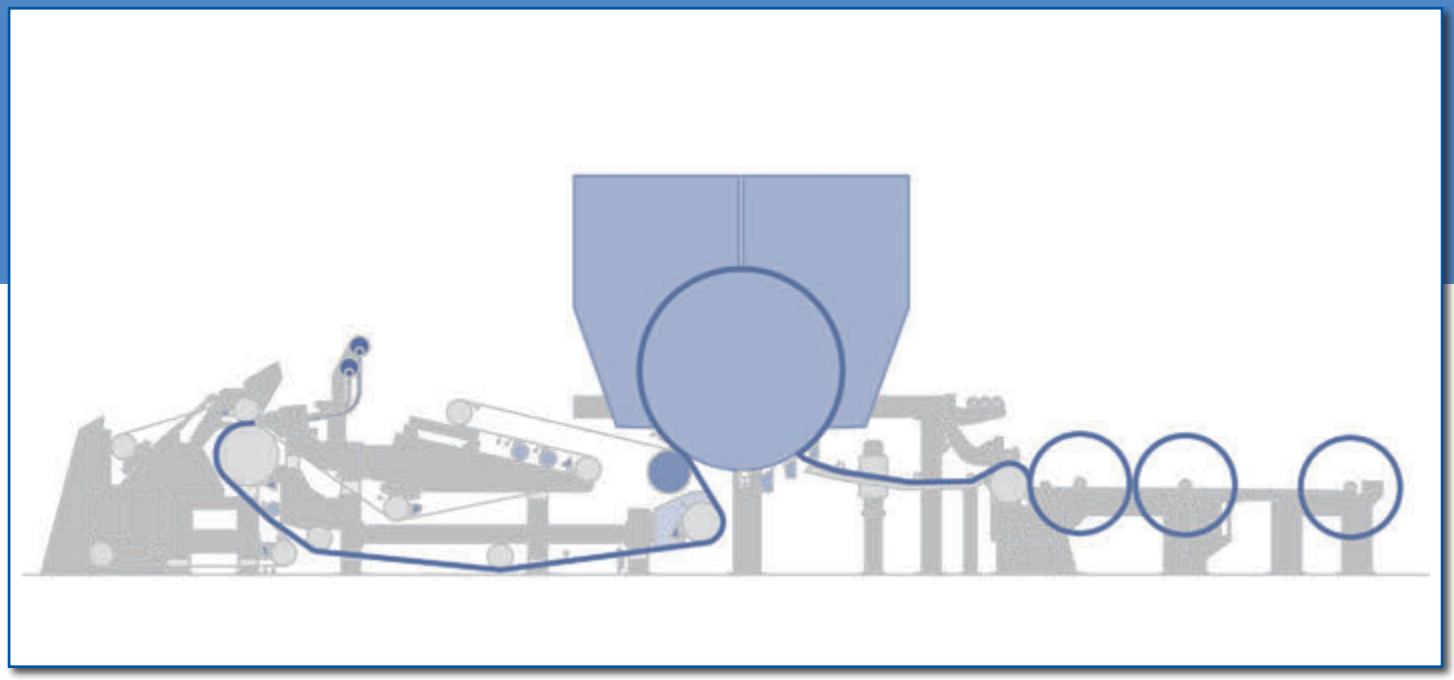
XcelLine

Voith presents a new generation of paper machines



▲ The machines from the XcelLine offer fast and easy start-up, excellent value for money, pioneering technologies, ease of use and integrated solutions.

Under the name "XcelLine", Voith has improved and refined its paper machines for all paper grades. The machines from the XcelLine offer fast and easy start-up, excellent value for money, pioneering technologies, ease of use and integrated solutions. by: TissueMAG

Quality and reliability have always been the outstanding hallmarks of Voith paper machines. As an experienced system vendor, partner to the paper industry and technology leader, Voith has been shaping global paper production for more than 150 years and offers the most extensive range of products and services on the market. The new generation of paper machines stands for "Xcellent Performance" and offers paper manufacturers decisive advantages: optimized individual components, combined with improved interfaces and process flows, result in a significant reduction in project and start-up times.

With its product and service innovations, Voith supports paper manufacturers on their journey into the digital environment. Papermaking 4.0 harnesses ideally matched products, technologies and services to machine performance and in this way ensures more profitable paper production.

As a full-line supplier with the largest range of services, components and products on the market,

▲ To ensure that a paper machine operates cost-effectively over its entire life cycle, reliable and professional servicing is an absolute must. Voith offers the service of its accredited teams of specialists for maintenance, servicing and optimization of the entire paper production facility – from raw material to wrapped paper rolls.

◀ Paper machines have to be hugely competitive in terms of operating costs and paper quality. Voith's paper production lines offer excellent paper quality combined with high efficiencies.

From a Locksmith's Workshop to a Global Technology Group

Voith is celebrating its 150th anniversary in 2017. On January 27, 1867, Friedrich Voith took over the locksmith's workshop owned by his father, Johann Matthäus, which was located in Heidenheim on the river Brenz. That was the beginning of the family-owned company's global success story. "We don't know what Friedrich Voith imagined at the time," says **Dr. Hubert Lienhard**, President and CEO of Voith, "but today we see what became of his ideas and dreams as a result of hard work, passion, and the dedication of generations of Voith employees: a global technology company with around 19,000 employees in more than 60 countries, which has made industrial history in many of its markets over the last 150 years. A family-owned company with strong values and a unique company culture."

Welcome to the Next 150 Years

"We are proud of our rich, successful history. But in our anniversary year, we will primarily be looking to the future," says Voith CEO Lienhard. "That is what we mean when we say 'Welcome to the Next 150 Years.' Friedrich Voith saw the major opportunities in his time, and seized them decisively. We have preserved this entrepreneurial and pioneering spirit. We want to take a decisive role in shaping the fourth industrial revolution in the 21th century following the example of our grounding father Friedrich Voith, who was one of the pioneers of the first industrial revolution." The company is targeting an additional expansion in 2017, in particular through digital applications. For this end, the company built the new Voith Digital Solutions Group Division in which the company brings together its activities in the fields of IT, automation, software and sensor technology. "In our founding year, 1867, electricity, paper and mobility were restricted to a limited number of people. The world was a different place. Since that time, Voith technologies have helped to change things," Lienhard says. "Today, we are on the threshold of major new opportunities. The world of industry is becoming a digital one. We are looking forward to that. The people at Voith are at home with change – there is no other way to grow that old."

◀ Dr. Hubert Lienhard, President & CEO.

Voith offers paper manufacturers comprehensive expert advice and solutions from a single source. The interaction of Voith BlueLine stock preparation and the new XcelLine paper machines ensures top-class paper production especially in respect of paper quality and machine efficiency. In recent months, successful start-ups have already been realized with XcelLine paper machines, for example with the installation of two packaging paper machines, Zoucheng PM 31 and PM 32, for Sun Paper. Just a few hours after start-up the PM 31 was producing marketable paper. Since then it has been running smoothly and stably at a high production level. One month later the PM 32 was also successfully commissioned.

One example of a successful XcelLine tissue machine is the Cheng Loong TM 16 in Taiwan. It is particularly energy-efficient, as the Yankee dryer hood is heated with steam instead of gas, while the combination with the NipcoFlex T shoe press reduces running costs.

With an operating speed of 2,001 m/min the TM 16 is regarded as the world's fastest tissue machine with steam-heated Yankee dryer hood. Voith Paper is a Group Division of Voith and is one of the leading partners and pioneers in the paper industry.

Through constant innovations, Voith Paper is optimizing the paper manufacturing process, focusing on developing resource-conserving products to reduce the use of energy, water and fibers. Furthermore, Voith Paper offers a broad service portfolio for all sections of the paper manufacturing process. Voith sets standards in the markets energy, oil & gas, paper, raw materials and transport & automotive. ●

> “Voith has been shaping global paper production for more than 150 years”

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Global Tissue Outlook

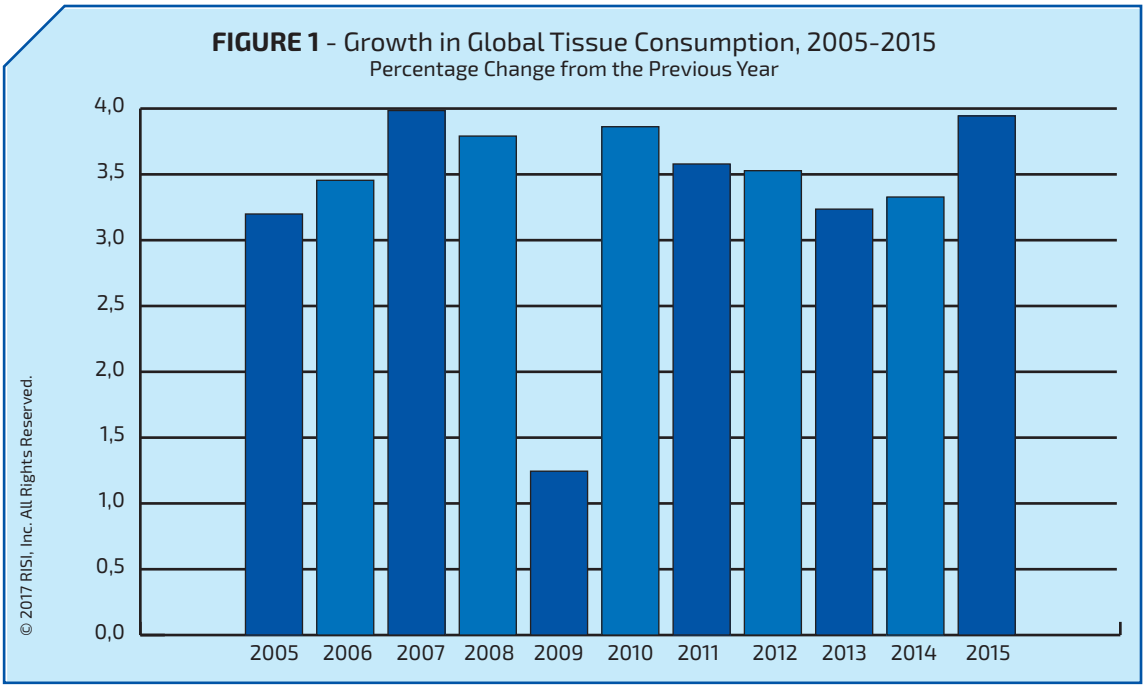
Strong demand growth led by Emerging Markets

Global consumption of tissue grew at an average annual rate of 3.4% in 2005-2015, and market volume increased by close to 10 million tonnes. The growth rate was lowered by the slow growth in 2009 as a consequence of the global recession. On this strong growth base, we have seen major expansions in the tissue industry in all regions. Normally, the global growth rate has remained above 3% annually even in difficult years, such as during the Asian financial crisis in 1998 and in the aftermath of September 11, 2001. The sound growth trend was abruptly broken in 2009 by the Great Recession and tissue consumption grew by only 1.2%, due primarily to declines in North America, Europe and Japan as all other regions showed some growth. However, since 2010 the global tissue market has recovered and experienced growth rates between 3.1% and 3.9%, with 2015 recording good growth of 3.9% after a mild slowdown in 2013-2014 (***Figure 1***).

RISI has just completed the latest 10-year global tissue demand forecast through 2025. The new forecast includes several changes from the previous one, but with the exception of a couple of regions and countries we can conclude that overall growth prospects in the global tissue business continue to be good.

by: Esko Uutela - Principal, Tissue at RISI

FIGURE 1 - Growth in Global Tissue Consumption, 2005-2015
Percentage Change from the Previous Year



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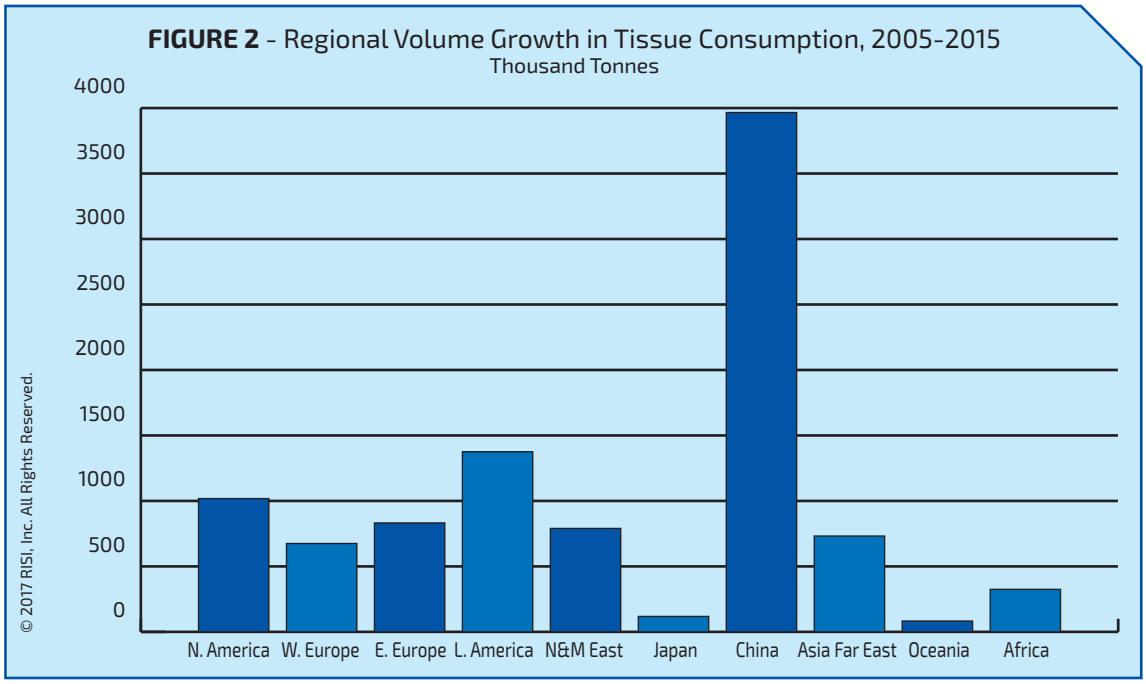

In 2005-2015, global tissue market expansion was driven by emerging countries. Based on volume growth over the last 10 years, emerging regions accounted for about 81% of global growth with North America, Western Europe, Japan and Oceania together making up the remaining 19%. China stands out with a roughly 40% share of the global growth in 2005-2015, followed by Latin America with the second largest volume growth among all regions. Volume growth in Western Europe was disappointing in the period, mainly due to the long-lasted recession in Southern Europe, which resulted in flat or declining tissue consumption for several years after the 2009 economic collapse. So volume growth in Eastern Europe, the Near and Middle East and Asia Far East exceeded that of Western Europe in the 10-year period as illustrated in ***Figure 2***.

> "The overall growth prospects in the global tissue business continue to be good"

RISI's latest forecast expects global tissue demand to grow by an average of 3.5% annually between 2015 and 2025, which is only slightly more conservative than our long-term 3.6% growth in the previous edition of the *Outlook for World Tissue Business*. China, which in recent years has shown explosive growth in tissue consumption, will continue to be one of the major drivers of global tissue demand, despite a slowdown in its growth rate. Apart from China, growth in relative terms is expected to be strong in the Near and Middle East, Africa, Eastern Europe and Latin America, but weak in Japan, Western Europe and North America. Volume growth over the forecast horizon will be more than 14.2 million tonnes, corresponding to 1.4 million tonnes annually. China will account 40% of the growth, followed by Latin America (14%), North America (11%) and the Near and Middle East (8%). The 80/20 relation in volume growth between emerging markets and developed regions is expected to continue. China is projected to become the largest tissue market in the forecast period; it surpassed Western Europe in 2014 and will overtake the United States in 2018 and North America (USA and Canada) in 2020 in terms of market size. This will take place providing China's economy continues to grow as assumed without any major collapses, enhancing average purchasing power and enlarging the middle class in the country. China's rapid urbanization pace will also contribute substantially to the expansion of the tissue business. The forecast does not include any speculation about the consequences from possible measures against free trade and other political issues which could change the global economic outlook and hence the prospects for tissue demand growth.

SCA Still the Clear Leader, but Otherwise, Changes in Ranking Continue

SCA Hygiene Products passed Kimberly-Clark (K-C) as the world's leading tissue supplier (>20% minority-owned subsidiaries are included) through

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the acquisition of the majority of Vinda Paper in late 2013 and now has about 830,000 tonnes more capacity than K-C. But even the largest tissue company does not account for more than 10-11% and the second-largest for more than 8-9% of global tissue capacity. APP's organic growth has made it the third leading global supplier before Georgia-Pacific (G-P), which is now the fourth-largest supplier with tissue capacity only in the USA. P&G's sale of its European tissue assets to SCA and recent closures in Mexico reduced its capacity, but it continues to hold the fifth position. P&G ended its international tissue production with the closure of its last Mexican tissue PM in April 2015. Hengan of China now holds the sixth position and has at least temporarily overtaken Sofidel after starting up a couple of new PMs in the second half of 2016 and more from delayed projects are scheduled to come on stream in China this year along with others recently announced, also for 2017. Sofidel acquired its first mill in North America and occupies the seventh position in the capacity ranking. It is expanding in North America by building a greenfield mill in Circleville, Ohio. These seven companies have an annual capacity of 1.0 million tonnes or more, and a capacity of more than 650,000 tonnes is now needed to make it onto the top 10 list. The total number of tissue mills in the world is quite large and there are several hundred entrepreneurs in the business. The top three companies, SCA, K-C and APP, currently hold 24%, the five largest 33% and the top 10 companies clearly less than half (42%) of the world's identified tissue capacity, which shows how fragmented the global tissue industry is. In 2005, the global tissue industry was more consolidated than today: the top three companies accounted for 39% of the global capacity, the top five for 48% and the top 10 for 56%. Two things should be noted: new mills in China have decreased the overall global consolidation degree and the top companies vary by region so that the global shares are lower than what would be expected by looking at the regional shares (***Figure 3***).

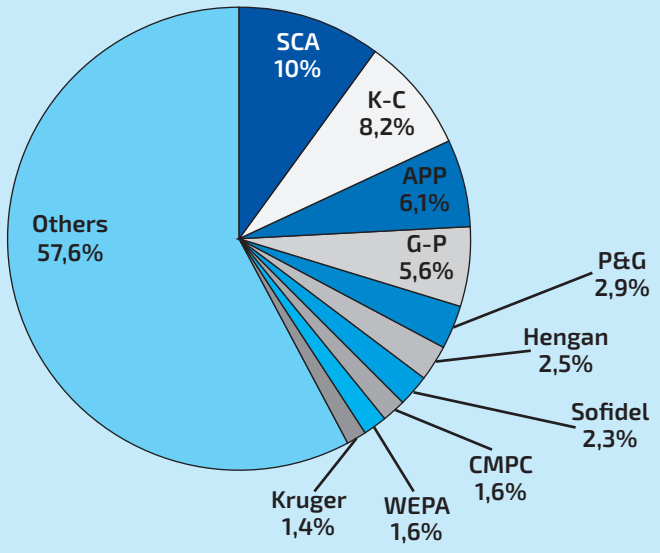
Global Overcapacity Is Evident

The tissue business has recently attracted a lot of new investments as it is one of the few paper industry branches that still has sound and continuing growth. Investment activity started to pick up in 2006 and 2007 and reached a new historical peak in 2008, very much affected by the high investment activity in China, as well as in other regions such as Asia Far East, Latin America and the Near and Middle East. The effective capacity increase continued at a high level in 2009, partly from investments and expansion decisions made in 2007-2008. The Great Recession in 2008/2009 slowed investment activity, so less capacity came on stream in 2010-2012.

> "The tissue business has recently attracted a lot of new investments"

But after the recovery in 2010-2012, companies started to plan new investments - and at an accelerating pace. The recent peak year for investments in the global tissue industry, 2008, was approached in 2014 and surpassed in 2015. There was another new investment peak in 2016, although some of the announced projects were delayed to a later date and some mill closures may have occurred in countries such as China, where

FIGURE 3 - Capacity Shares of the Main Global Tissue Suppliers, 2016



Total Installed Tissue Capacity: 46.0 Million Tonnes (End of 2016)

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Suppliers
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Sofidel rewards its most sustainable suppliers

Sofidel awarded the winners of the first edition of the **Sofidel Suppliers Sustainability Award**, the recognition that the Company, first in the tissue sector, established to promote, disseminate and enhance the best practices and improvement measures implemented by its suppliers in the field of social and environmental sustainability. The award is based on the TenP platform, a self-assessment tool designed and sponsored by the Global Compact Network Italy Foundation, of which Sofidel is a founding member and promoter. In addition to congratulating the winners of the three categories, we extend our thanks to all the suppliers who participated and to the partners Elettric 80, Fabio Perini, Södra and Henkel (Global Partner), SAP, Pulsar and ICP (Premium Partner), Treedom (Official Partner) and TWM (Media Partner), who contributed to the event's success.

Best Supplier

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A Brambles Company

Henkel

SCA
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TMC
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Vizeum
Connections that Count

Best Sustainable Project

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Flexible Packaging

Metsä

Kinect
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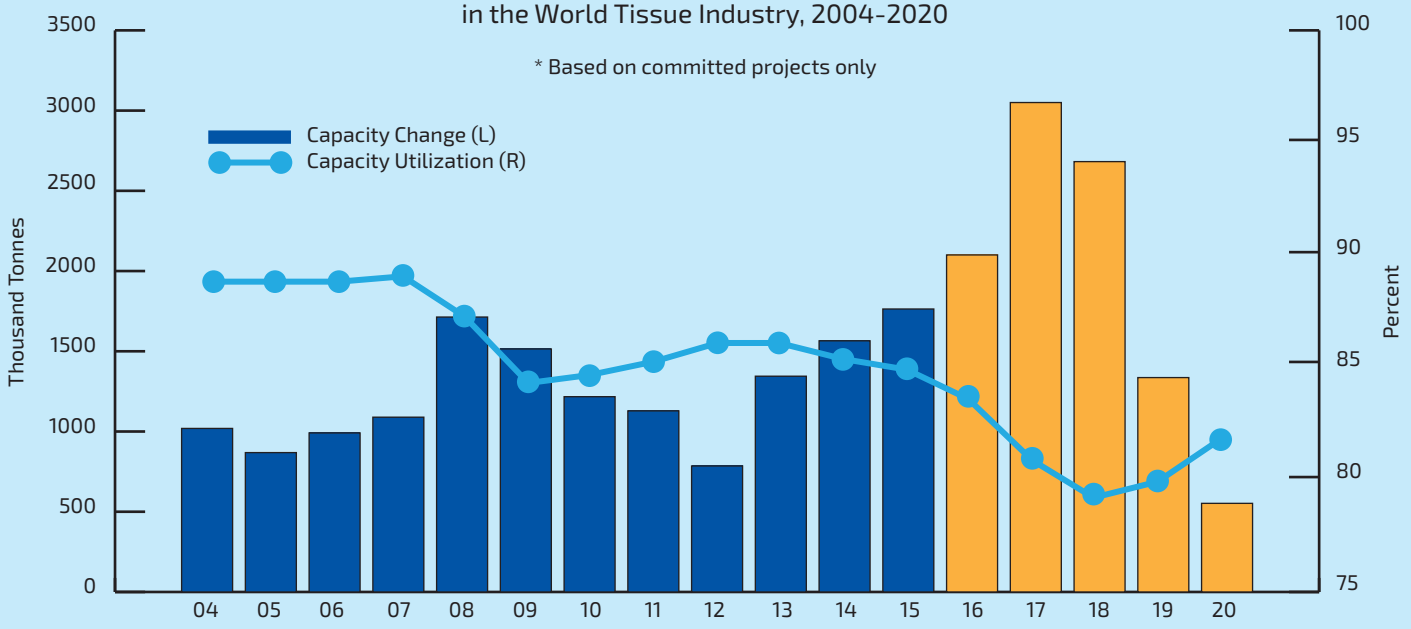
FIGURE 4 - Net Capacity Change* and Capacity Utilization in the World Tissue Industry, 2004-2020



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mill shuts often cannot be immediately recorded. The net capacity change should be, according to current project announcements, about 2.1 million tonnes in 2016 after nearly 1.8 million tonnes in 2015. And as if this is not enough, 2017 currently shows an effective net capacity change of about 3.0 million tonnes! However, this level of investment is not sustainable with consumption growth of only about 1.1-1.3 million tonnes per year, so something must happen, which means project postponements, delays and most probably major closures of older tissue capacity. Current calculations from new projects show a net capacity increase of 2.7 million tonnes for 2018, again much more than the global tissue market growth is expected to be. Investment activity has overheated not only in China, but also globally. Ultimately, the global tissue market will not be able to absorb all the announced expansions, and delays are likely as suppliers have no interest in building PMs that will be idle due to a lack of demand. The average capacity utilization rate in the global tissue industry remained rather flat at around 89% in 2004-2007, although there were large regional variations. Substantial investments in new capacity resulted in a nosedive in the utilization rate in 2008, and with the cut in global demand due to the recession, the downward trend continued in 2009, when global average tissue industry operating rates fell to slightly above 84%. There was a mild improvement in 2010-2012 when fewer expansions came on stream, but the average operating rate did not quite reach the level of 87%, somewhat below the historical long-term average. Since 2013, capacity utilization has been in free fall due to the accelerating investment activity, and remained below 84% in 2016. New supply from massive investments, particularly in China, Latin America and North America, will send the global tissue capacity utilization rate into further decline in 2017-2018. There is a serious threat of global overcapacity, which can only be relieved though project delays, postponements and closures of older capacity. Our current calculations show that the average global tissue industry operating rate could fall as low as less than 80% in 2018 and 2019, which is a horror scenario for industry profitability. However, we do not believe that this will happen as companies will change their plans and restructuring will occur. Nevertheless, the prospects for realizing new investments in the next few years are not very good (***Figure 4***). In conclusion, there is substantial overcapacity developing in the global tissue industry and this very competitive phase is expected to continue through the next three to five years. ●

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◀ The inkjet printing unit is marked by a stylized Chameleon.

Printing customized napkins, with any possible subject, without additional costs and waste of time especially with short runs, is now possible thanks to Chameleon by OMET digital technology.

by: TissueMAG

▲ Infinitive printing possibilities for napkins with the new inkjet printing unit by OMET.

Launched in 2015, this revolutionary inkjet printing unit, already installed on several machines, obtained widespread approval so far, especially among the converters dealing with the retail or directly with privates. Now it is ready to take a step forward. Chameleon is a "direct-print" system which erases changeover time and costs and gives free access to creativity and innovation, since it enables the impression of images with variable data with no limits. For any napkins converter it is a real life-change in terms of just-in-time deliveries and customization, which confers a unique value to the final product. This goes beyond the simple printed napkin. It leads to a product that can satisfy different requests and transform, for example, into an advertising vehicle or a souvenir.

Its high-technology mechanism works in a very intuitive way: a PC installed on the side of the group receives the documents with the graphics and it processes them according to the parameters chosen by the operator. All you need is selecting the PDF file with the images to be printed and the job is ready to go. Chameleon can be installed in-line on OMET TV503 and can print with a maximum speed of 200 mt/min (656 ft/min).

"This system is particularly interesting to converters who supply napkins to restaurants, companies, or even printers selling to privates through the Web - explains **Marco Calcagni**, OMET commercial director -. It allows the production of packs with different napkins or special napkins with serial codes, QR codes,

◀ Some samples of digital printed napkins in the output of OMET machine.

▼ Digital Unit Chameleon installed in-line on OMET TV503.

> “With Chameleon, OMET showed once again to be able to anticipate the trend of the market”

Wi-Fi access credentials, daily menus or a family picture.
With this module, it is possible to create something new every time you need it in order to lead the market and differentiate your production from the competition”.
With Chameleon, OMET showed once again to be able to anticipate the trend of the market. “At the moment there are no alternatives to Chameleon - declares Mr. Calcagni - but OMET does not lose the focus: the new version of the printing group is ready to be launched. It will be able to print on a wider web width, up to 432 mm (17”)”.

The Chameleon inkjet printing group was center stage at the Open House organized by OMET last April 2017.
The manufacturing site of OMET opened its doors to all the players that wanted experienced the possibilities offered by this technology, as well as took a closer look to all the tissue converting lines offered by OMET featuring new important technological applications. It has been like taking a step into the future: with Chameleon, the constant research for the integration between tissue converting line and digital printing reaches high efficiency standards. ●

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phone: +39 0341 282661 - **email:** comm@omet.it
website: www.tissue.omet.com

Runtech Systems

New EP600

RunEco Vacuum System

Customer case: Ipek Kagit TM3

Ipek Kagit TM3 in Yalova, Turkey, is a 5.6 m double-width tissue machine, running 1,800 m/min. Annual capacity is over 60,000 tons of tissue paper.

Replacing liquid ring pumps in Turkey saves mill 50% in electricity. "Ipek Kagit's TM3 in Turkey saved 50% in electricity costs when we decided to replace 3 liquid ring pumps with one Runtech EP500-700-D1 turbo blower. The paper machine vacuum levels were optimized based on Runtech's EcoFlow™ dewatering measurement system. Water savings have been significant, since Runtech turbos do not require any water," says Maintenance Manager Erdem Serkan.

For more information, visit www.runtech.fi | sales@runtech.fi

Creping...
the Heart of Tissue

FIGURE 1 SHOWS THE VARIOUS ANGLES FORMED BETWEEN THE CREPING BLADE AND THE YD.

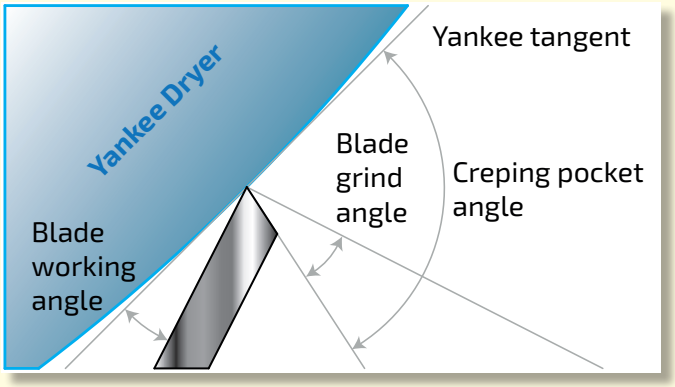
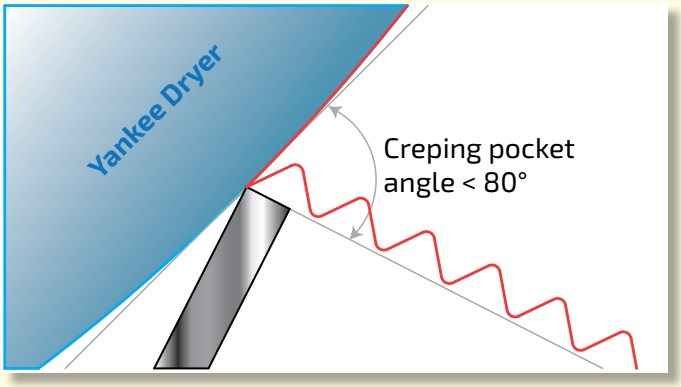


FIGURE 2 - A CREPING POCKET ANGLE BELOW 80 DEGREES WILL DETERMINE A COARSER BUT MORE BULKY TISSUE.



Tissue is a unique paper product. We all know very well and that cannot be mistaken with any other paper grade thanks to its softness and bulkiness.

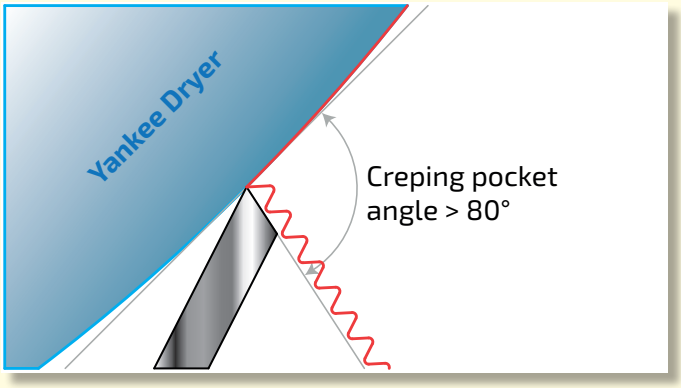
by: BONETTI S.p.A.

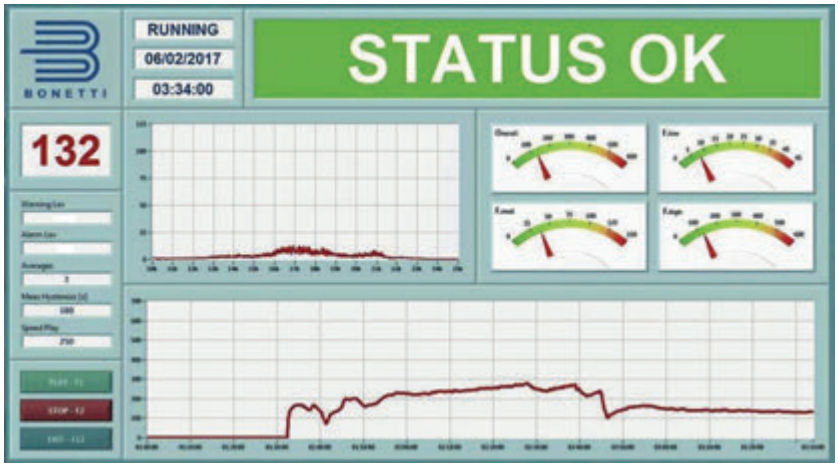
Strange as it may sound its manufacturing process is almost identical to those used to produce the other types of paper: tissue contains the same fibers, it undergoes the same treatment and it contains many of the same chemical additives. It is formed on similar fabrics, pressed and dried in similar ways too. CREPING is what sets it apart from all the other grades and this is why a better understanding and a correct set-up of the creping operation are crucial to the success of any tissue machine.
The geometrical set-up of the creping blade against the Yankee Dryer (YD) is simple but very important when it comes to the structure of the tissue paper it will produce. **Figure 1** shows the various angles formed between the creping blade and the YD. The parameter defining the application is the Creping Pocket Angle: it is defined as the angle between the YD tangent line and the creping blade bevel.

> “Bonetti is right now one of the major suppliers to the tissue industry worldwide”

The Creping Pocket Angle can be calculated with the following equation:
Creping Pocket Angle = 90° - Blade working Angle + Blade Grind Angle
As a rule of thumb, a Creping Pocket Angle below 80 degrees will determine a coarser but more bulky tissue (**Figure 2**). A Creping Pocket Angle above 80 degrees will determine a more fine but less bulky tissue (**Figure 3**). If we were to consider a Blade working Angle constant at 20 degrees, then a Blade Grind Angle of 10 degrees would represent the dividing value between a coarser and finer creping. Different Blade Wear Angles will clearly affect this.
Bonetti can boast a long experience in the supply of products for the creping application that dates back to the seventies: when it comes to its products Bonetti is right now one of the major suppliers to the tissue industry worldwide. Over the years we've helped numerous customers improve their creping process taking a comprehensive approach spanning from the blades to the doctoring equipment, them being both part of the current product portfolio.
The main areas where Bonetti focused its efforts have been the sheet quality improvement, the increase of the overall efficiency of the tissue machine and the reduction of its operating costs.
The approach is diversified and tailored to the specific demands of the customer and Bonetti have been therefore bringing to the industry new tools and new products. A good example of new tools is BONVIBES, Bonetti's new Vibration Monitoring System **(Figure 4** and **Figure 5)**. This new system helps the tissue maker monitor the development of the vibrations of the creping doctor over the lifetime of the blade thus allowing the correct scheduling of the blade changes. This in return greatly reduces the risk of chatter marks on the YD surface and a better control of the coating distribution.
When it comes to new products the MIZAR (Chrome Oxide) and SIRIUS (Chrome Carbide) blades, when compared to a traditional carbon steel blades, extend the lifetime of the creping blade and

FIGURE 3 - A CREPING POCKET ANGLE ABOVE 80 DEGREES WILL DETERMINE A MORE FINE BUT LESS BULKY TISSUE.





▲ Figure 4 - BONVIBES, Bonetti's new Vibration Monitoring System.

▲ Figure 5 - BONVIBES, Bonetti's new Vibration Monitoring System.

greatly improve the softness of the tissue produced. These two blade qualities complete each other: whereas the MIZAR offer the longest possible lifetime, the SIRIUS, while sacrificing a small amount of lifetime, allow for a smoother start-up, are not prone to chipping and can be machined with sharper angles suitable for Super Soft tissue grades (**Figure 6**).

For those customers not willing or not yet ready to switch to tip coated blades, Bonetti have been promoting with success a move from the traditional "old style" multiple re-grinding of used carbon steel creping blades to the use of new blades only in the creping position. The advantages coming from this philosophy far outweigh the extra cost associated to the higher number of new blades being used and have prompted several customers, even in those markets were the tradition of re-grinding the used blades is more entrenched, to switch. In general, the use of new blades only in the creping position helps the stabilization of the YD coating and the achievement of more consistent sheet quality parameters since the blade geometry and finishing does not change from blade to blade.

Finally the equipment: as one of the most established suppliers of doctor and creping equipment Bonetti know what are the needs of the market and is constantly working hard to find the right solution. One good example is the double doctoring system for the press roll of tissue machines. This system's primary target is the removal of as much water as possible from the roll surface and from the holes drilled on it, whether blind drilled or connected to a suction. Major advantages coming from the installation of this equipment are a higher dryness content after the press and a more uniform humidity profile entering the YD. This technology is best practice in some of the biggest tissue groups in the world. ●

FIGURE 6

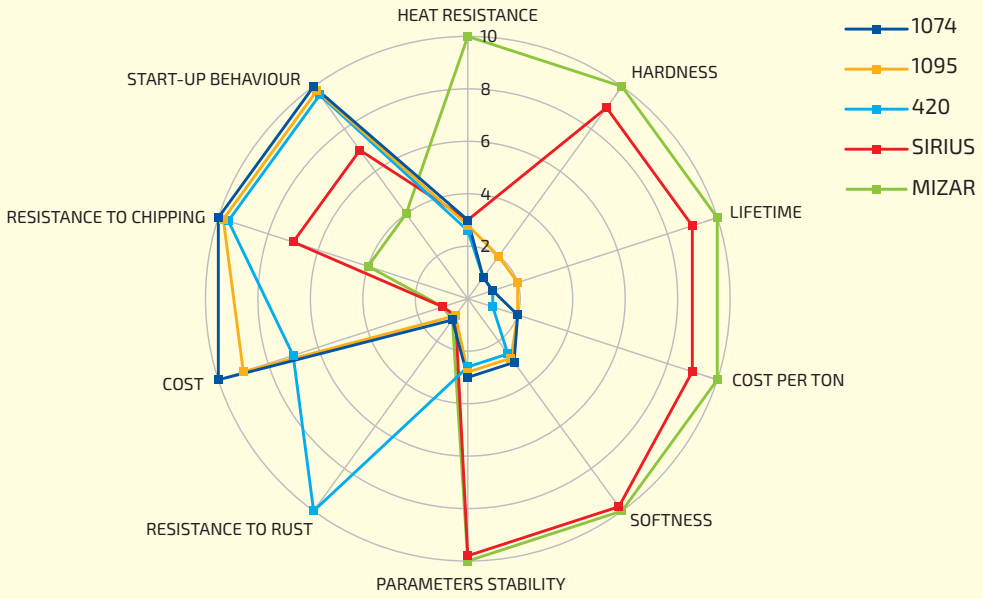
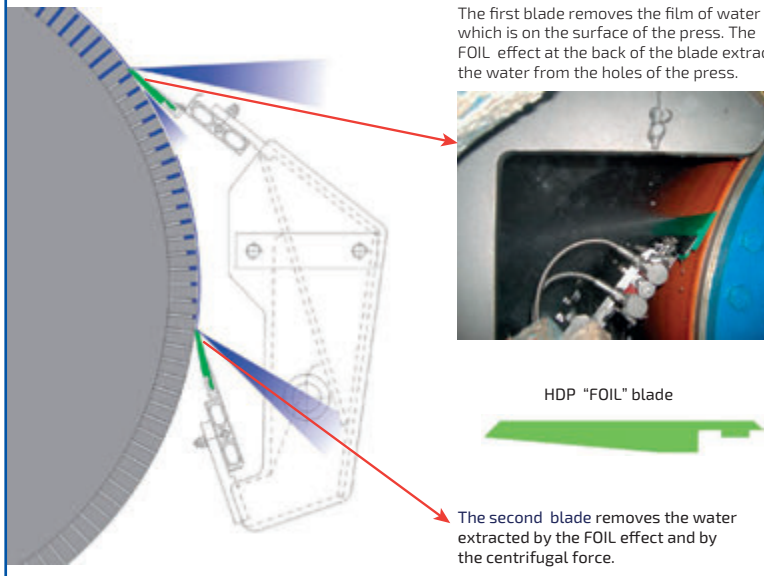


FIGURE 7

Double doctor for suction press



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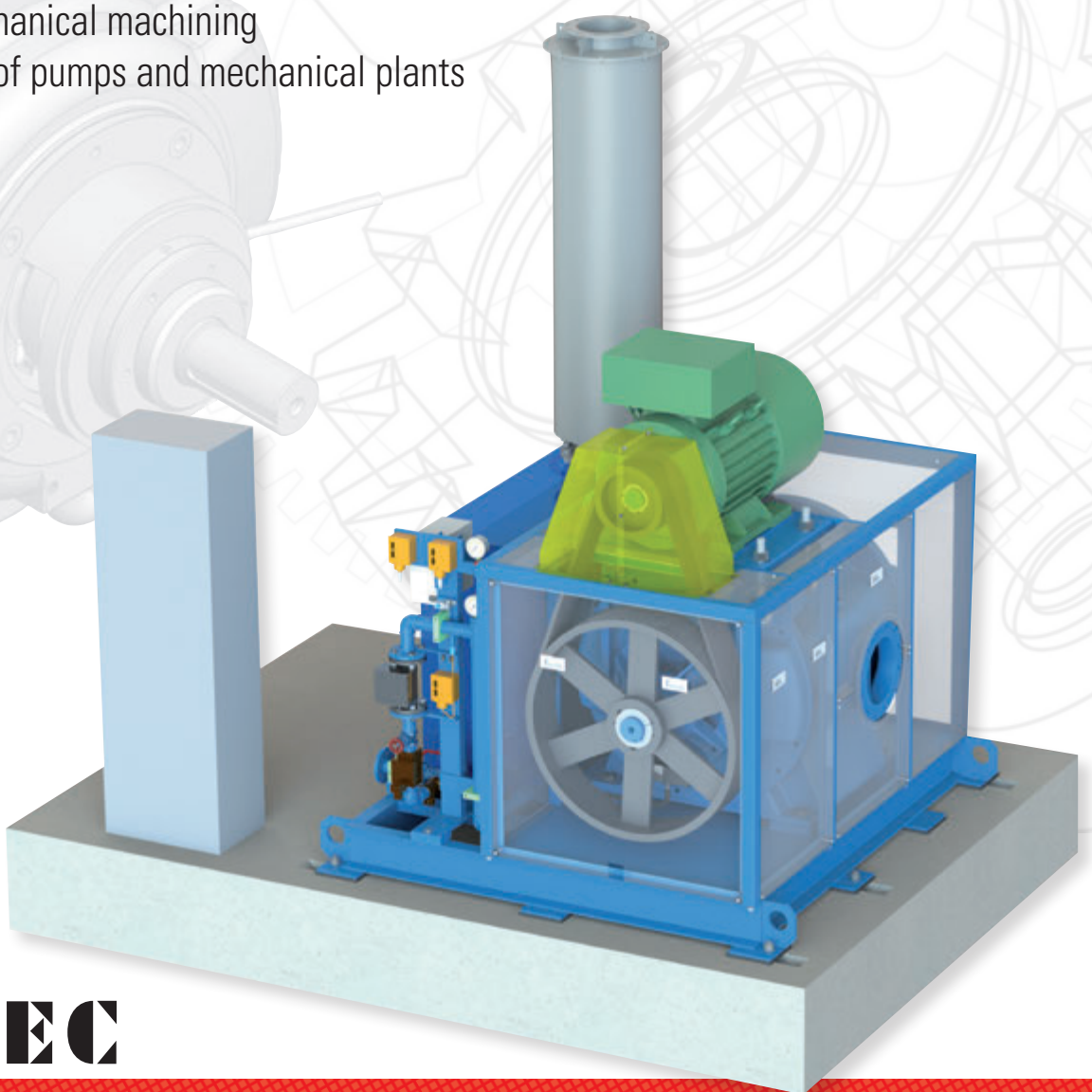

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EAC

Solenis

combines a startup mentality with established leadership to ensure consistent growth and market strength

Solenis, Krefeld plant (Germany).

Hydrolysis is a common chemical reaction in which bonds are broken, releasing energy. The acquisition of Ashland Water Technologies by private investment firm Clayton, Dubilier & Rice was, in many ways, a type of hydrolysis, cleaving the Industrial Water and the Pulp and Paper business units from Ashland Inc. to form Solenis, a standalone specialty chemical business.

by: TissueMAG

Building a Growth Culture

Solenis is grounded in a strong heritage that includes Ashland Water Technologies, Betz Laboratories, Drew, Stockhausen and Hercules. According to Jeff Fulgham, Senior Vice President and Chief Marketing Officer, "There was a lot of debate about the kind of company we should be, even the name we should use. Some people wanted to go back to Hercules, but we felt strongly that we needed a new name. It gave us a chance to start fresh."

Beyond the name itself, starting fresh meant creating a single unified culture with common goals and values. Driven by Solenis President and Chief Executive Officer John Panichella's vision of an organization commercially focused around customers, the company embarked on an intensive culture-building initiative built on 12 core beliefs organized around

three priorities - People, Performance and Results. The culture work began in September 2014 and by June 2015, the core beliefs were vetted and approved.
A series of surveys have since measured the pulse of the Solenis employee population, and participation rates have been as high as 93 percent.
The ultimate goal, however, is not simple participation but acceptance and internalization. As Katy Abernathy, Director, Global Marketing and Business Communications, points out, "Safety is a metaphor we use all of the time. We are one of the safest organizations in our industry, thanks to a conscious and deliberate campaign we have executed over the years. Now, safety is part of the daily routine of our employees. That's where we want to be with the Solenis corporate culture."
Even though there is still work to do on the culture front, the progress has been impressive. In fact, speed and agility have been equally important watchwords. Consider that the new Solenis organization began with no HR department, no financial officer and no IT infrastructure.
According to Iris Melendez, Director of Global Talent Management, Solenis put some stopgap recruitment measures in place to keep the organization moving forward. "That got us from point A to point B," Melendez notes. "Now we have a recruiting manager in place, and we're somewhere between point B and point C - looking at recruitment with totally fresh eyes, figuring out how we want it to work in the new Solenis culture. Same thing with training: we stopped training in the transition from Ashland, but now we've launched an extensive global leadership curriculum, as well as a global sales curriculum, and we're investing heavily in the professional development of all our employees."
Creating an IT team from scratch required another herculean effort. The company's approach, according to Solenis Chief Information Officer Charles Wallace, was to keep the IT function small. "We looked for high-energy people who could see through the confusion, visualize an end state and then fight their way to it," he says. "We also decided that, while we wanted to own the IT strategies, we wanted to take advantage of managed services for key capabilities. This approach has enabled us to get a lot done - initiate the digitization of business processes, consolidate our enterprise resource planning platform to a single instance of SAP, assess and mitigate security threats - but has also enabled us to look toward the future so we can help the company grow."

▲ Jeff Fulgham, Solenis Senior Vice President and Chief Marketing Officer.

▲ John Panichella, Solenis President and Chief Executive Officer.

Blueprint for Success

Building a sustainable business that is 100 percent committed to helping its customers succeed is an idea that permeates the culture and drives all of the key strategic decisions.
"Growth is our number-one priority," Jeff Fulgham observes. "We need consistent top-line revenue growth, and to get it, our strategy must have several legs. Mergers and acquisitions are important - we've closed five deals in the last two years and we have a rich pipeline of deals in the works. Aggressive growth in emerging markets is also critical. And, of course, innovation - bringing new products to the market - has always been a high priority."
What's different today is how Solenis innovates. Coming from so many legacy companies, the organization didn't have a clear approach for early-stage innovation. Some teams embraced one methodology, while others went in different directions. As a result, the business launched a number of products that received only lackluster attention from the market.
To re-energize its innovation strategy, Solenis adopted the Blueprinting framework and software, developed by the AIM Institute, and appointed Melinda Burn, Global Director, Strategic Marketing and Innovation, to lead the company's effort. "Blueprinting takes the voice of the customer and makes it quantifiable," Burn explains. "It's a two-phased approach that starts with Discovery Interviews to identify actionable problems, followed by Preference Interviews to discover market satisfaction gaps - problems that are felt across the market for which there are no solutions."
Over the last eight months, Solenis has engaged a significant number of its customers across all key segments, standardizing its approach to early-stage

innovation while filling its pipeline with market-defined product development opportunities. At the same time, the company has looked closely at new product introductions - how to launch more effectively and how to evaluate NPI performance in the market. "We're really trying to understand our tracking process," Burn says. "For example, we're looking at both the percentage of products classified as NPIs - less than five years old - as well as the percentage of revenue coming from NPIs."

The focus on innovation is paying off. Solenis has recently introduced a number of products, technologies and services that have had significant impact for customers and the company. On the water and process side of the business, as Vice President of Marketing, IWT, Jeff Ballew points out, the focus has been on execution. "We have a number of products - antiscalants, rheology modifiers, biocides that are exciting." For example, the launch of new Polystabil™ scale inhibitors and Performax™ cooling water treatments have helped enterprises in a variety of industries improve operations, reduce downtime and still adhere to increasingly severe regulatory guidelines for chemical usage. On the pulp and paper side, introductions of innovative products, such as the Biobond. Improving the Sustainability of Paper℠ program and new Crepetrol™ creping adhesives, have enabled packaging, paperboard and tissue and towel manufacturers to truly revolutionize how they make paper.

Across all market segments, OnGuard™ controllers and analyzers, as well as a web-based service to collect data from those technologies, continues to impress customers who need to monitor system performance in real time.

Fast Forward

All of this adds up to make Solenis a strong company with a bright future. As Solenis Vice President of Marketing, Pulp and Paper, Ricardo De Genova points out, "We're really excited by the opportunities ahead of us. We're undisputed leaders in certain markets, but we have plenty of room to grow. And in certain markets, we think we can reinvent the industry. The overall scenario for Solenis is very positive."

Jeff Fulgham agrees. "We're doing well in spite of a number of big global changes. There's a lot of noise in the financial markets, a lot of deflation in oil markets, anticipated inflation in raw materials, yet we still have been able to consistently achieve top-line growth and deliver our products 98 percent on time our best supply chain performance ever."

This positions the company well as it prepares for the future, now a smaller, stronger, more adaptable organization, thanks to its hydrolysis from Ashland Inc. ●

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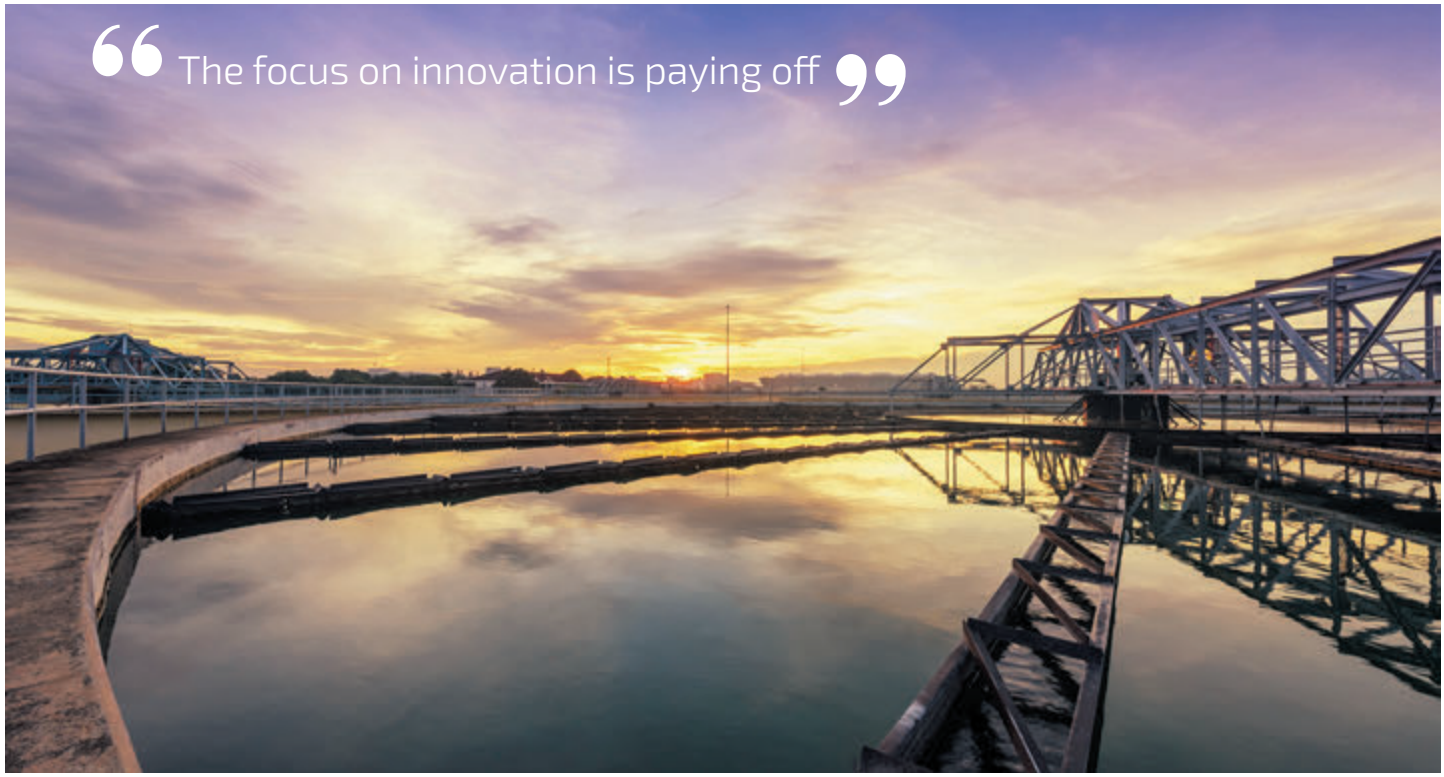

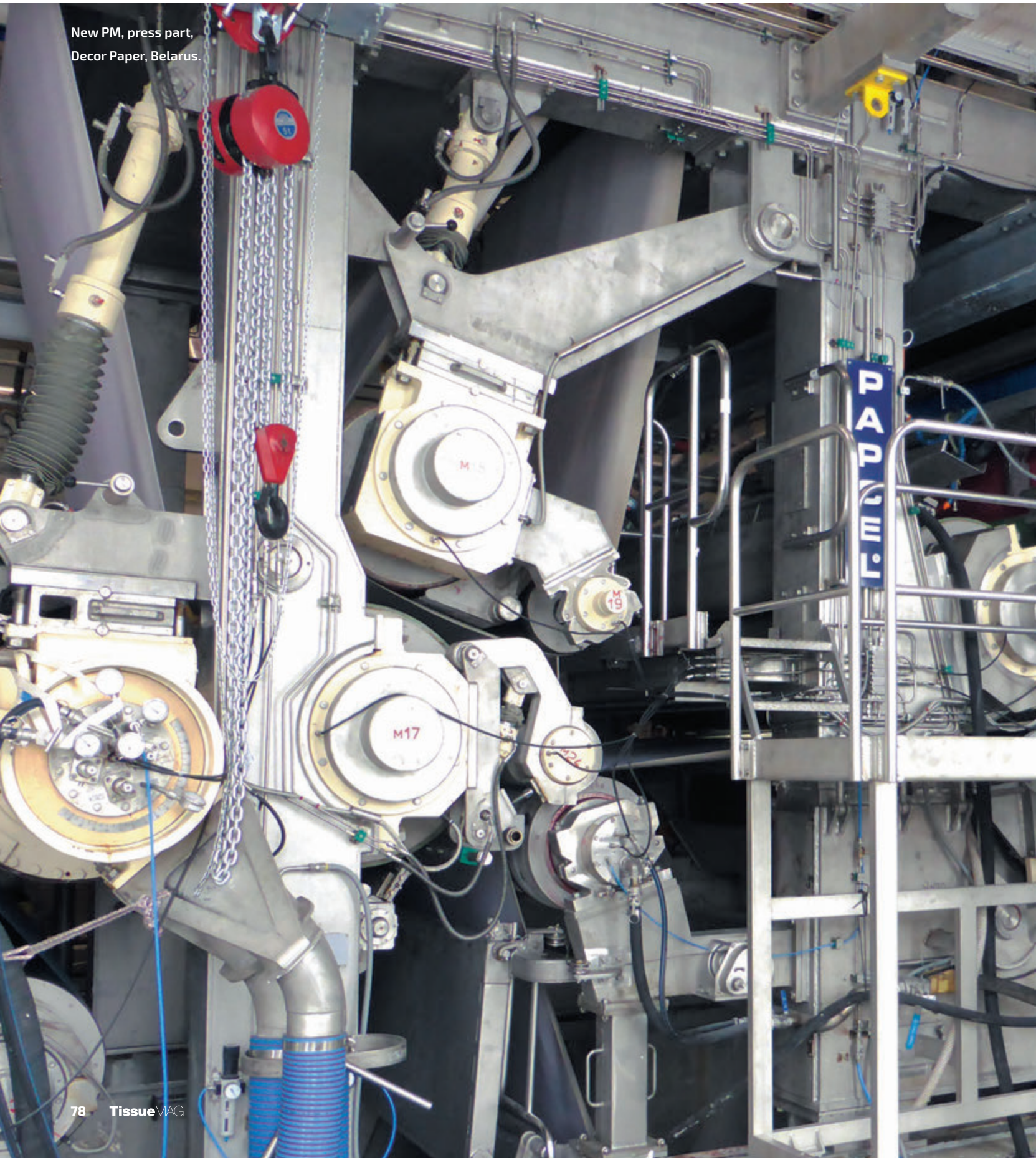

New PM, press part,
Decor Paper, Belarus.

PAPCEL Czech Republic.

Supplier of complete technology for the paper industry

PAPCEL Group is a Czech commercial technology company with more than 65-year tradition in manufacturing and deliveries of complete papermaking machinery for production of all the commercially available paper grades. The Group ranks among major worldwide suppliers of modern energy-saving solutions with an emphasis to meet all contemporary environment protection aspects.

by: TissueMAG

PAPCEL has been active in the paper-making industry since 1950. The company owns manufacturing facilities in the Czech Republic and in Italy and has a network of experts with many years of experience in the paper production and papermaking technology sector, who are involved in own research wand development. PAPCEL is a sole exporter managing subsidiaries in Russia and India and more than twenty sales agencies worldwide. PAPCEL is an international company group with a strong tradition and respect to customers. PAPCEL is a supplier of complete paper mills including supporting utilities and infrastructure. The company has built and erected many paper machines worldwide. The company has dismantled, refurbished and commissioned a lot of volume challenging projects concerning

▶ GapCon tissue s.r.l., new tissue PM, Argentina.

"used machines" in Europe and overseas. PAPCEL is a multicultural company with sales and technical work teams located in various countries worldwide speaking several world languages. Thus, the company is able to offer comfortable services utilising long-term knowledge of papermaking practice and long-standing experience of high-tech deliveries during project implementation. PAPCEL Group is a skilled supplier able to implement complete EPC projects (turn-key deliveries) thanks to own design capacity, own chemical equipment division and high-tech level of supplied automation. PAPCEL Group manufactures and delivers machinery and equipment for complete stock preparation lines and paper machines producing all commercially available paper grades. PAPCEL Group provides deliveries of single machinery units, complete turn-key technologies, repairs, overhauls and refurbishments of particular production nodes as well as complete lines. Spare parts, complete maintenance and technical services are provided for the delivered machinery. The equipment and machinery deliveries are supplemented with engineering services related to machinery erection and commissioning. PAPCEL Group production range also includes complete services related to "used papermaking machinery" rebuilds and refurbishments and relocation of the machinery anywhere in the world.
The scope of the services offered by PAPCEL Co. covers both the financial and the commercial and engineering services. The complete scope of deliveries can be divided into the following areas: financial services; commercial and engineering support; machinery deliveries; engineering services and consulting. The service portfolio includes deliveries of brand-new machinery as well as deliveries of refurbished used machinery combined with new equipment.

Financial consulting

- elaborating investment projects and feasibility studies: creating business plans for new investment projects, project profitability assessment, cost and utility demands (power, water, gas, steam, etc.) calculations, calculating total return on investment;
- elaborating complete bases for arranging export credit or other ways of project financing: credit application filling; environment impact assessment; communication with banks and/or insurance agencies; communication with banks after opening L/C.

> "PAPCEL has been active in the paper-making industry since 1950"

New PM, wire part, Decor Paper, Belarus.

Machinery deliveries

- new paper machines (”turn-key” deliveries) of wire width up to 8,000 mm and operation speed up to 1,500 m/min. (papers for production of packaging materials - fluting, liners, etc.; semi-products for gypsum boards; coated/uncoated carton boards; printing and writing papers; cigarette papers; decor papers; safety paper; tissue papers; filtering papers);
- new complete stock preparation lines (SPL) processing recycled paper and/or chemical pulp for capacity up to 1,200 tpd;
- SPL processing chemical pulp for tissue production;
- SPL processing recycled wet-strength papers or liquid packaging boards of the TETRAPAK® type;
- deliveries of standard machinery and equipment single items for SPL, approach flow systems and PM;
- complete lines for manufacturing, dosing and storing starches and other auxiliary papermaking chemical agents;
- refurbishing and rebuilding used papermaking machinery and SPL;
- pressure and non-pressure cylinders and rolls, Yankee cylinders.

Services (Basic engineering)

- detailed descriptions of processes, elaborating process flowsheets;
- making and/or arranging machinery and equipment accompanying documentation in required languages;
- project preparatory phases coordination, machinery and equipment layout final approval.

Services (Detailed engineering)

- elaborating complete project and design documents: mechanical operation documentation; documentation of electrics, measuring and control; mechanical projects;
- project management: machinery delivery management; coordinating works with civil project suppliers; project implementation schedule and controlling;
- erection check-up management; commissioning; performing guarantee tests;
- after-sales service, technical consulting.●

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website: www.papcel.cz

W+D FLOWTOS.

Meet the industry's fastest 2-lane tissue-fold and packaging machine

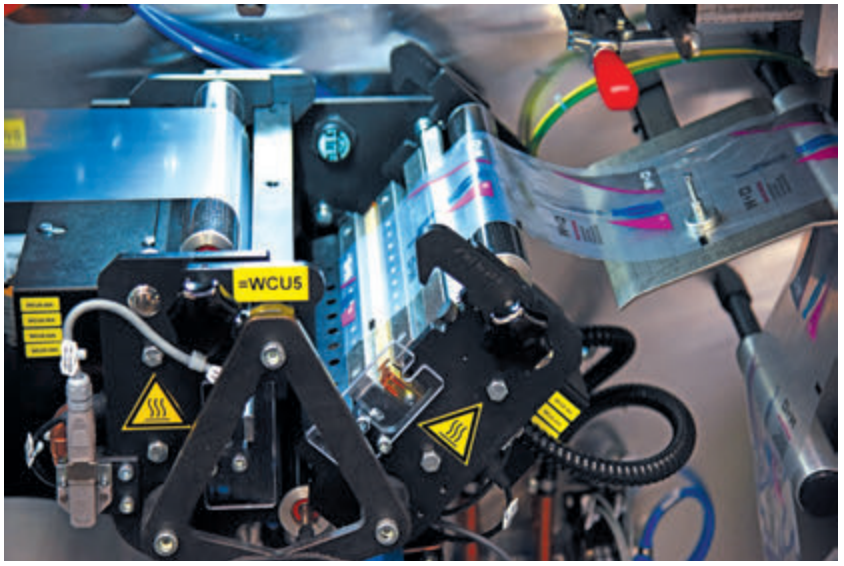
W+D FLOWTOS - FLOW-wrap Tissue Operating System - embodies a whole new dimension of paper tissue production.

by: TissueMAG

Since its introduction in 2013, the W+D FLOWTOS has established itself as a technological breakthrough for flow-wrap tissue folding and packaging machines. Since then, customers from Europe, South-America and Africa have profited from the high-performance capabilities and flexibility of the machine. It not only optimizes the efficiency of tissue production but reduces the environmental footprint, i.e. by avoiding considerable amounts of foil and tissue waste.

Easy to operate, adjust and maintain

Thanks to its cantilevered design, the W+D FLOWTOS converter is extremely accessible and easy to load and maintain. Settings can be smoothly adjusted in a couple of minutes so that a wide range of product requirements and size variations can be produced in less time. The number of handkerchiefs per pile can be flexibly changed from 5 to 15 tissues without exchanging any size parts, but merely via operation of the control panel. W+D FLOWTOS also offers precision vacuum folding technology for converting different tissue thicknesses from 2 to 4 layers. It features a separate embossing section and a smoothing section for a superior finish, too. The new generation of tissue production also provides



▲ The W+D Foilsplicer for single packages saves time and money.

solid stability to ensure outstanding performance and productivity - around the clock.

Packaging over 460 single packs per minute

The W+D FLOWTOS single-pack wrapping and bundling unit transforms the way of packaging and stacking paper tissue products. The best-in-class materials and precision engineering ensure a smooth, reliable packaging platform at high speeds. For example, the integrated high-class W+D cutting technology and quick-change knife roller guarantee a precise foil perforation of the more than 7 single packs produced per second.
What's more, as W+D FLOWTOS is made up of very few component parts, it is very easy to make the adjustments needed to vary package size and the number of sheets per package - for both standard and compact tissue formats. Over 460 single packs per minute can be packaged in bundles of 6 to 56 handkerchief packets.
W+D flow-wrap technology enables the W+D FLOWTOS packing unit to merge packaging foil and sheets with such accuracy that single-pack packaging is achieved at exceptionally high quality and operational efficiency.

▼ Fast and flexible: the W+D FLOWTOS.

Tape Applicator for re-closable packages

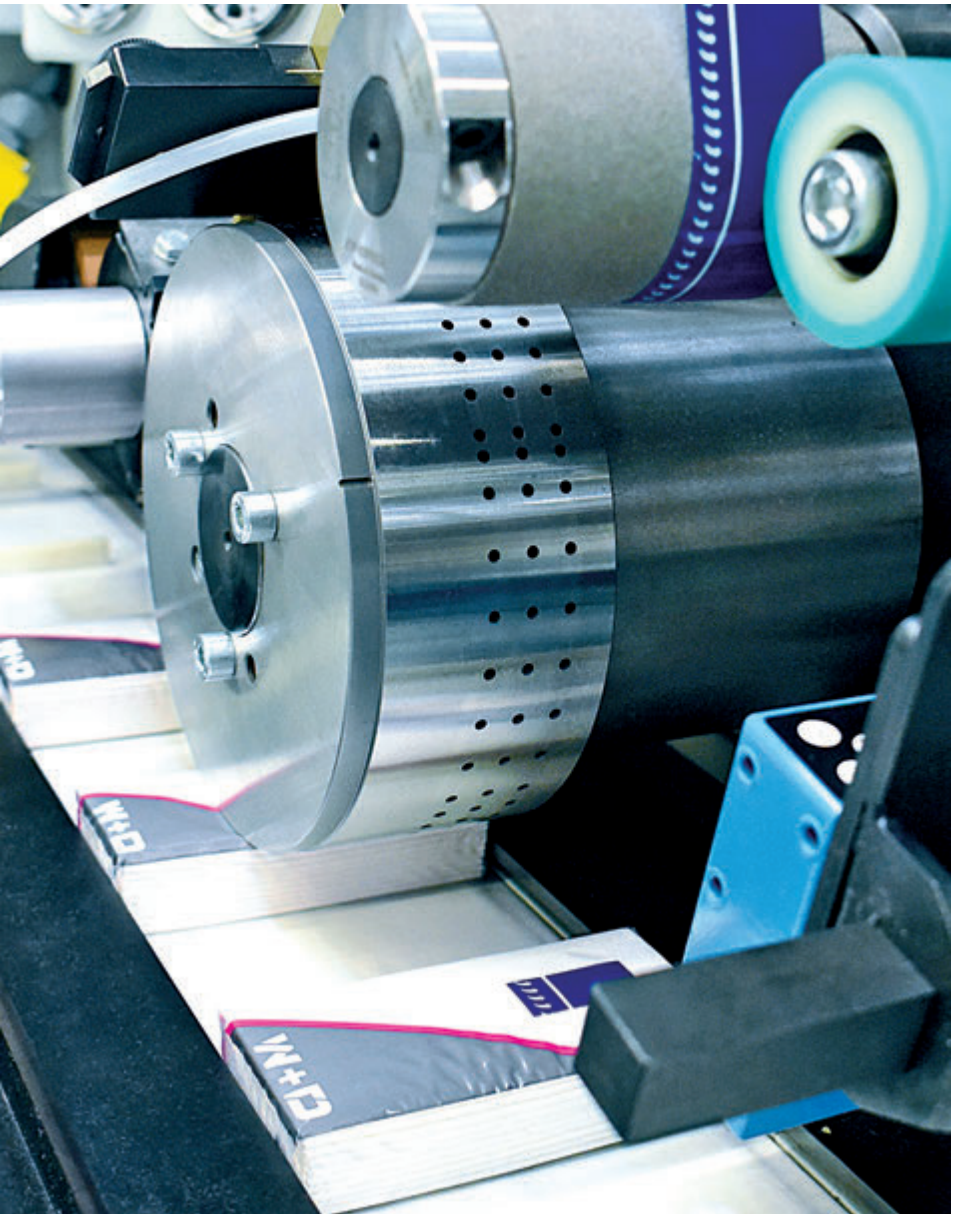
The W+D Tape Applicator is designed in such a way that partial pre-glued adhesive tape can be applied in different sizes to a wide variety of different types of packages. It is ideally suited for applying closing tape to allow easy re-opening, even to different packaging types of tissue.
This system can be considered more cost-effective and environmentally-friendly than label applicators or marking devices, too, because no waste in the form of carrier materials such as siliconized paper is produced. The W+D Tape Applicator is therefore ideally suited as an option of a label applicator for the tissue product line W+D FLOWTOS.

The innovative Autosplicer boosts productivity by up to 10%

With the W+D Autosplicer, the company has also developed a tissue-roll changer for handkerchief folders which saves up to 10% of machine downtime.

▼ W+D FLOWTOS training with operators from the Ivory Coast.

> “Over 460 single packs per minute can be packaged in bundles of 6 to 56 handkerchief packets”



▲ The flexible W+D Tape Applicator for re-closable packages.

Winkler+Dünnebier GmbH
Sohler Weg 65 56564 Neuwied - Germany
phone: +49 2631 84583 - **fax:** +49 2631 8470583 - **website:** www.w-d.de

Winkler+Dünnebier GmbH (W+D) offers a wide range of highly efficient, integrated system solutions for the mail and postal industry, as well as for the tissue and hygiene industry. With more than 100 years of industry-shaping innovations, W+D has core competence in the converting and processing of thin and in-homogeneous materials - such as paper, tissue and nonwovens - at high speeds and tight tolerances. With W+D innovative and tailor-made system solutions and services, W+D focuses on the entire internal value chain for their customers. Part of the Barry-Wehmiller family, W+D has production and distribution sites in Germany, Malaysia and the United States, with sales and service support around the world.

The vacuum splicer ensures a stable mechanical bond between two tissue webs each made out of two plies or more. A web-tension conditioner secures the constant tension of the tissue web. The new Autosplicer is available in two working widths, for two and four wide folders of W+D.

The new Foilsplicer for full-speed changes

An additional feature that enhances the already waste- and cost-effective technology of the W+D FLOWTOS is the W+D Foilsplicer. By automatically changing foil-rolls for single packages during full production speed, it is designed to guarantee a nonstop production.

W+D FLOWTOS trainings to qualify operators worldwide

Worldwide FLOWTOS trainings are offered by W+D for operators and for maintenance staff as expert training. These professional trainings are highly recommended to optimize tissue production: they convey a structured knowledge of the machine, avoid possible misuse of the machine and enable the staff to find solutions for complex questions on their own. Finally, the trainings lead to an optimum of job preparation, machine maintenance, quality and efficiency in production. ●

Checkmate in four moves!

Felt Engineering®

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Soft-Top® & Twin-Top®

BINET SUL LIRI S.P.A.

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▲ In the warehouse.

This company, established in the heart of the paper district of Lucca in 1993, has grown quietly yet efficiently into one of the most important partners for Italian and European companies producing and processing different types of paper.

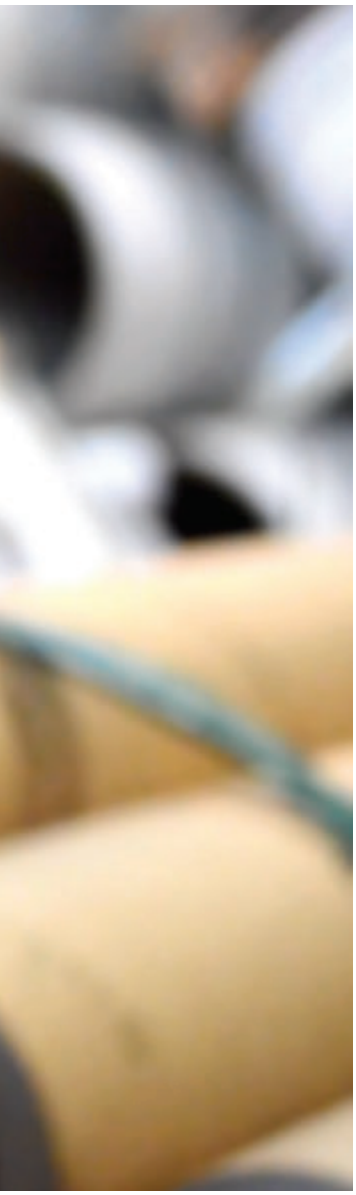
Cardboard cores, at the core of the business, as the figures prove

Tubicom, which can boast well-established partnerships with all tissue companies and an output of millions of tubes a year, took advantage of prestigious international showcases in 2017, to meet their clients as well as to get the latest news and learn of the technological advancements in the manufacture of tissue.

With over 24 years of experience in the manufacture of tubes for paper mills, Tubicom has grown into a leader in expertise and technology. The company's pride and joy is a product of superior quality: the large-diameter cardboard tube.

Large-diameter tubes: high rotational speed and robustness in the most stressful conditions for perfect reusability

This distinctive tube has led the company to broaden its business beyond Italy and reach many



Tubicom: the evolution of large-diameter tubes

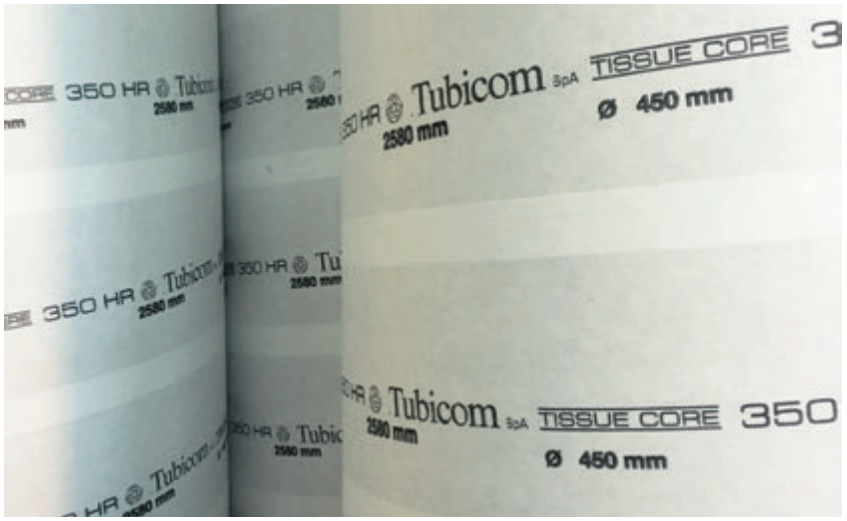
24 years of progress: into the future, with quality, reliability and efficiency. Every day, in Italy and Europe, many producers in the paper sector rely on the professional standards of Tubicom in the manufacture of high-quality spiral-wound cardboard tubes.

by: TissueMAG

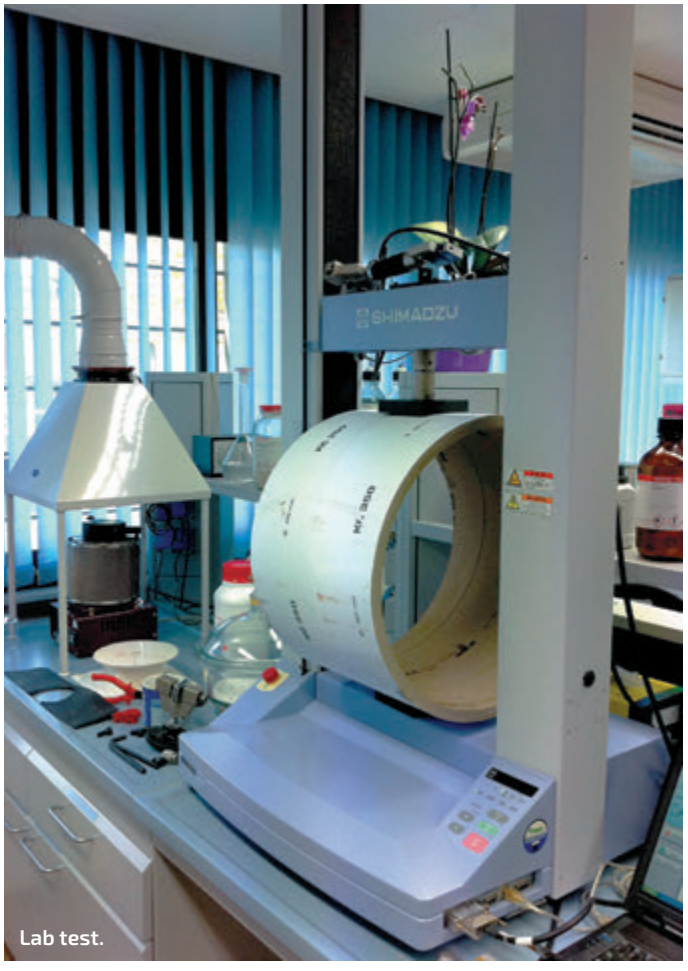
clients across Europe. Total customization is the key imperative for all their large-diameter cardboard tubes. Every single detail and technical specification is agreed upon with the client.
The inside diameter can range from 76 mm to 600 mm, with a maximum thickness of 30 mm and other different specifications depending on the final intended use.
Every day, Tubicom technicians test the products against the strict UNI 10328 and ISO 11093 standards. Another important achievement of the company is UNI EN ISO 9001 quality management certification. Last year's innovations in manufacturing included the launch of an optical monitoring system for the gluing process which delivers the highest quality standards and thereby ensures the tubes are manufactured in compliance with the relevant technical specifications.
In addition, the tests and simulations carried out in the lab and on the paper machines ensure these large-diameter cardboard tubes meet compression strength, wear resistance, torsional strength, high rotational speed and resistance to the most stressful conditions. Another distinctive feature is that they are extremely practical in that they are reusable: Tubicom tubes may be reused in the manufacturing cycle over and over again, without buckling or wearing out.

Stock on Demand, Tubicom's solution for all your storage problems

The company has devised an exclusive service for every type of tube: Stock on Demand, a helpful and effective service aimed both at streamlined planning of the manufacturing cycle and easier management of the client's stock. Consequently manufacturing costs are reduced.
Stock on Demand is the solution developed by Tubicom to fulfil its clients' logistic requirements: the company takes great care of every single processing step, from the packaging to the delivery of the tubes. Every year, the company offers a wide range of packaging and packing options to meet customers' needs: packages vertically arranged on pallets, on horizontal frames or on cradles.
Using the efficient Stock on Demand service, clients can order the tubes and receive them precisely when they need them, with shipments planned in multiple stages and delivered right on time.



▲ Large-diameter Tubes.



Lab test.

> Tubicom is one of the most important partners for Italian and European companies producing and processing different types of paper

Attention to environment and sustainability

The extended reusability of Tubicom products endorses not only the company's respect for, but also its heartfelt belief in, caring for the environment. As its processes comply with the regulations on the disposal of special oils, recyclability and energy savings, no pollutants are released by the manufacturing cycle.
Waste is 100% recyclable, and separate waste collection is employed at all Tubicom sites.
From tube selection, to investment appraisal, and right through to warehousing, Tubicom provides Italian and European companies and paper mills with the best professional advice. Staff assist customers step by step throughout the manufacturing cycle, ensuring the provision of tubes of extraordinary quality together with a timely, unfailingly flexible tailored service. ●

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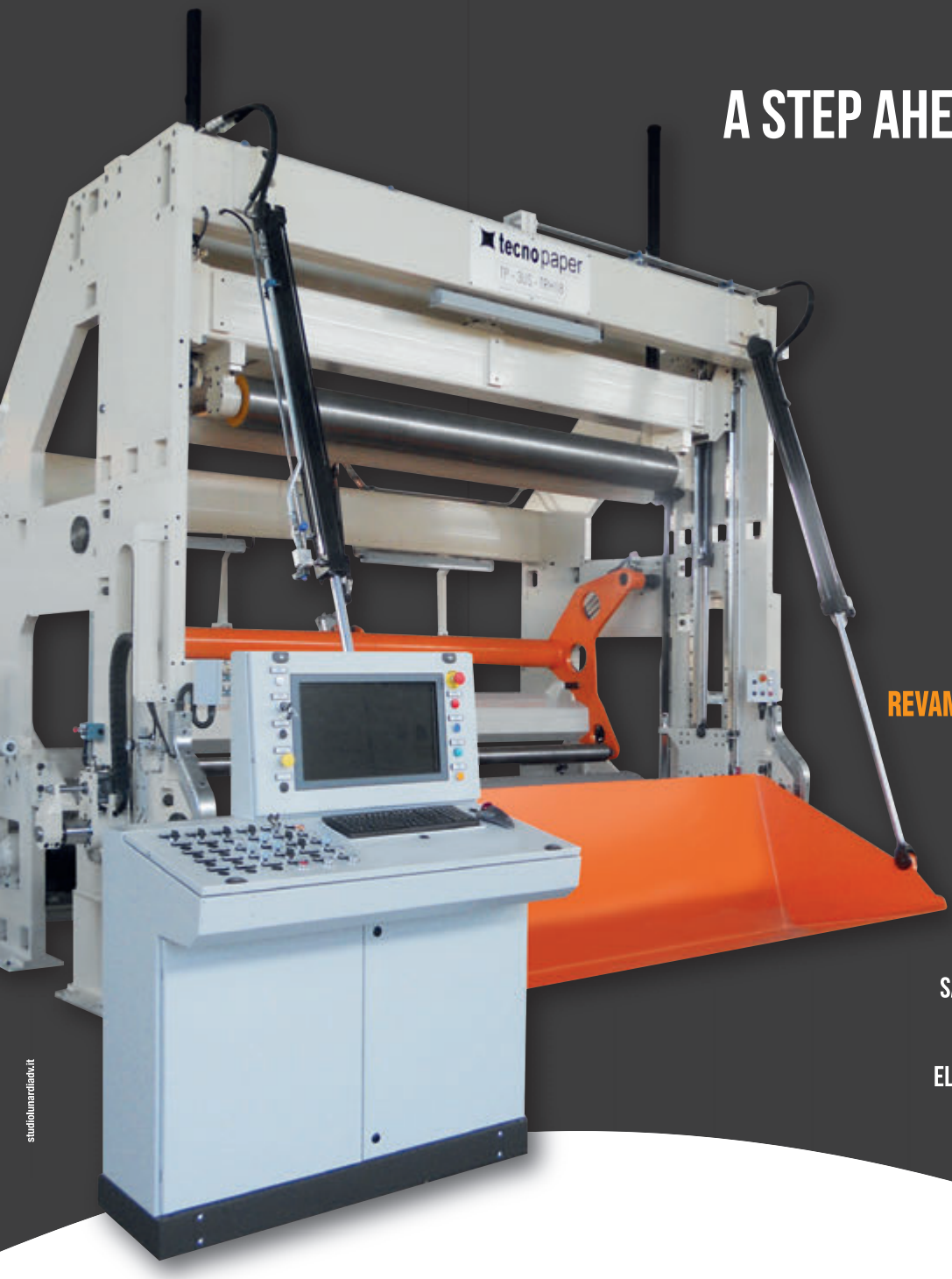

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Automatic

packaging and wrapping machines dedicated to the tissue industry

Microline is specialised in the manufacture of machinery for packaging delicate products with specific requirements and with increasingly flexible packaging tailored to meet the specific demands of the retail channel.

by: TissueMAG

Microline solutions for tissue sector guarantee high performance thanks to top quality machines manufactured to the highest technological standards of this sector and with first-rate materials and components. Microline manufactures **shrink wrappers**, **case packers**, **bundlers**, **flow wrappers** and **palletisers** for folded products (napkins, paper tissues, interfolded) and paper rolls (industrial paper rolls and AFH paper products).

Today Microline is the only international company able to offer such a vast range of machines for the whole tissue industry: case packers for folded products and paper rolls, shrink-wrappers for paper rolls, conventional two-reel bundlers, or the latest generation flow-wrap machines.

Among the products making up the vast range of Microline packaging systems, case packers (for rolls and folded products) occupy a prominent place; these completely automatic machines are designed to form and fill "American-style" slotted cases, i.e. erected and glued cases, also in a display version. These machines are divided into two different types: horizontal (side-loading) case packers (ROM) and vertical (top-loading) case packers (RVM). Basically, the machine picks up a pre-glued carton blank for an "American-style" slotted case from the case magazine, erects the case (with positive flap folding), fills it (according to the chosen collation) and closes the case with adhesive tape or hot-melt glue. The case packer also features a 1-metre capacity magazine that allows high autonomy; the case magazine can be topped up/loaded without having to halt the production cycle. Furthermore, if the machine has to manage different cases, "size change parts" (parts to be replaced in the machine filling unit) are supplied. Changeover operations are quick (max. 10/15 min.) and simple.

Secondly, but no less important, there are shrink-wrappers for paper rolls, conventional two-reel bundlers, and flow-wrap machines of the latest generation.

end-of-line

Display cardboard case (RSC) plus cover.

The Microline roll wrapper (**AL80**) is a machine designed for horizontal packaging and wraps products with plastic film, either polyolefin (POF) or polyethylene (LDPE or MDPE). It is an automatic machine able to handle rolls in single, double, or triple collations; the output rate is up to 210 rolls per minute for the collation 1x3.
The machine creates perfectly sealed bags containing the desired product collations. The bags are then heat shrunk to perfectly fit the shape of the product inside. This type of packaging is especially well-suited to paper rolls for industrial use (AFH) and hospital paper rolls. Rolls are picked up from a conveyor belt, put "in phase" and then the wrapping cycle begins. If needed, a divider can be supplied to arrange rolls in parallel lines (double or triple collations). The pack is closed on its upper part by film edge overlapping, followed by ionisation and a longitudinal seal operation (without contact). Then it is transferred to the transversal seal station where the packs are parted. The completely wrapped roll is made to pass through the shrinking tunnel. Roll packs can be customised with (glueless) label insertion or printed film.
With this packaging process, film consumption is approximately 20-25% lower compared with other wrappers available on the market. The wrapping process does not generate any scraps or rejects of wrapping material, which cuts disposal costs and reduces shrinking temperatures. Given these multiple advantages, the cost of the entire process is 30-35% lower. A new feature this year is no doubt the centre folding unit which can be integrated with the AL80 wrapping machine and enables the use of a centre-folded reel or a single-ply sheet reel. This device is capable of centre-folding a single-ply sheet reel and turning it into a centre-folded (or "V") reel.
The conventional two-reel bundler (**ML1500**), on the other hand, is a machine suitable for packaging collated products. As a packaging material it uses heat-sealable, heat-shrinkable polyethylene film (LDPE). The shrink-wrapped bundle remains partially open at the sides and a sealed pack can be obtained by using extra film. This type of packaging is especially

◀ Double roll package with label on the inside.

> “Microline is a partner of leading manufacturing companies in Italy and worldwide”

well-suited to pre-packaged paper rolls for industrial use (AFH). The products coming from the saw are upended (the core is put in a vertical position by a roll upender), if necessary divided into several lines (switching system), arranged according to the desired collation and pushed into the wrapping station, then shrink-wrapped. Where required, the machine can introduce a label inside the bundle, to be applied with glue. The packaging process does not generate any scraps or rejects of wrapping material. This type of packaging facilitates the handling and distribution of this type of product. The wrapping material is plastic film, i.e. heat-sealable or heat-shrinkable polyethylene (LDPE or MDPE). The FLOW WRAP 1000 is likewise a machine suitable for horizontal packaging and wraps products with heat-sealable or heat-shrinkable polyethylene film (LDPE or MDPE).

This type of packaging machine is able to handle products grouped together in bags. The machine creates perfectly sealed bags containing the desired product configuration.

This type of packaging is especially well-suited to paper rolls for industrial use (AFH) and hospital paper rolls.

The rolls coming from the saw are fed to the machine by a system of conveyors that orient and convey them inside the machine in multiple rows; then they are counted and arranged according to the desired collation. The selected rolls are subsequently inserted into the bag, which is then closed by cutting the film crosswise and folding the edges inside the package.

FLOW WRAP 1000 is the first machine in this market segment to be completely controlled by a servo-motor system.

Thanks to this solution, both size changeovers and general machine functions can all be easily controlled from the touch-screen panel. This machine can pack up to 18 bags per minute, without the need for a shrink tunnel, in all configurations demanded by the market.

Its innovative conception brings advantages in the packaging process, in terms of both consumption of materials and energy savings: the flow wrapper creates tight fitting bags that do not necessarily require the use of a shrink tunnel.

When necessary, the machine can work with pre-printed film and an oven can be used to heat-shrink the bag.

The packaging process does not generate any scraps or rejects of wrapping material, which cuts disposal costs.

The meticulous selection of the mechanical and electrical components, special care take during the design phase, and an efficient after-sales service have today made Microline a partner of leading manufacturing companies in Italy and worldwide. ●

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Revamping, upgrade and new safety devices of existing Tissue Winding Machines

Machines and systems are more and more often subject to modification, revamping, rebuilding work that involves a number of actors, in various roles: the employer, manufacturers of machines and partly completed machinery, end users, automation suppliers, installers and company maintenance technicians. The complexity of the work requires high-level professional expertise and know-how on the part of all the persons involved, such as to guaranty achievement of the three main objectives: machine Safety, Quality and Efficiency. The respective responsibilities of the manufacturer and the employer as regards the design and manufacture of the safety devices must be clear and distinct right from the beginning of the project. Safety must be obtained by correctly managing the responsibilities of the various subjects involved.

This must be done clearly and in advance, defining the supply contracts with extreme care.

An appropriate risk assessment must be carried out during the initial design stage, and consequently the implementation of all the safety measures required must be defined, and all the documentation needed to demonstrate machine and/or system conformity with current regulations regarding health and safety in the work place must be prepared. But what are the references to be adopted for safety purposes?

The machines to be altered may be more or less "old", with or without the EC marking, conform or not conform to current safety standards. A complex machine composed of a number of machines and/or partly completed machinery can create not few difficulties during the upgrading process.

Application of European Directives entails that the employer improve the safety measures of machine in use. It is possible that a machine, by virtue of its "years of use", has a safety level equal to that originally provided for by the original manufacturer of the machine itself, or it may have been adapted,

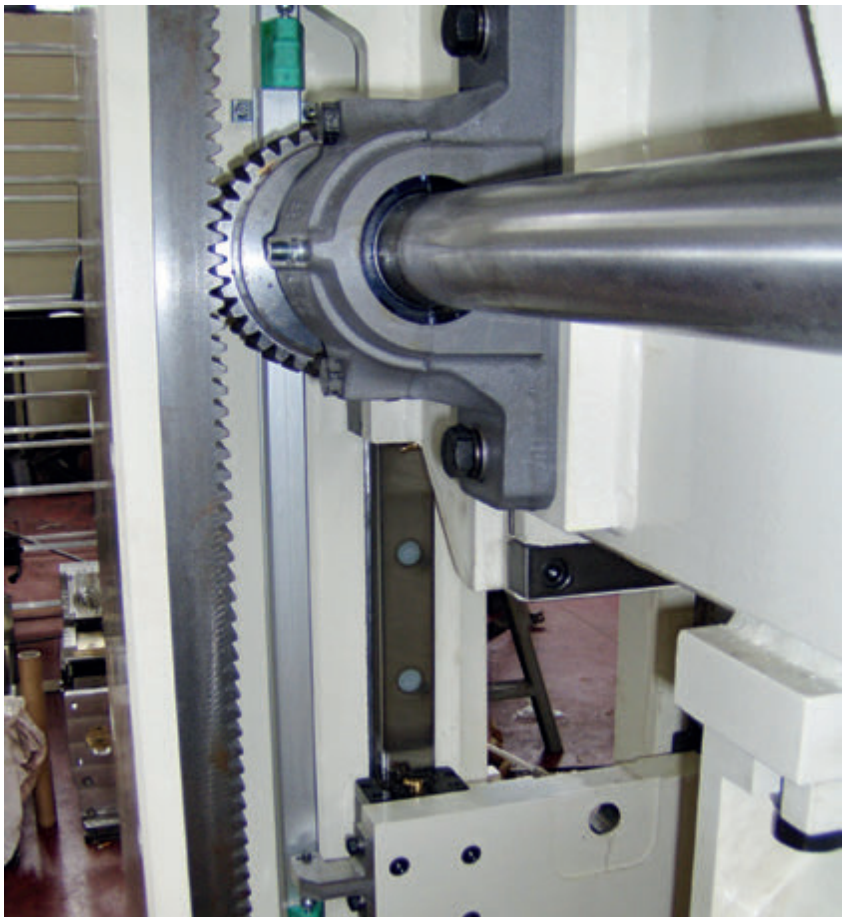
▲ Perimetrical protection for winding line.

Tecno Paper S.r.l. is increasingly committed to designing and certifying modifications on existing machines to upgrade safety devices by performing risk assessments, developing the project for the upgrades, carrying out the modification and releasing the Declarations of Conformity.

by: Tecno Paper S.r.l. - Technical and R&D dept.

▲ New shaftless unwinder unit with hydraulic cylinders for winding line.

> “Safety must be obtained by correctly managing the responsibilities of the various subjects involved”



▲ New rider roll for slitter winder with mechanical syncronisme.

as far as possible, based on the technical evolution of safety standards. When assessing plant machinery, an employer will never question machine design, but will assess the "evident" risks, that is to say, those that a good technician, who is not particularly specialized in technical standards and regulations for machines, but nonetheless absolutely competent as regards machine operation and use, can detect by inspecting the equipment, the place of installation and the use that is made of the machine itself.
To the contrary, whoever designs and creates an alteration must have the competency required to evaluate not only evident risks, but also occult risks, because the alteration must obligatorily be executed in greater compliance with the state of the art. Whoever designs and creates the alteration, working on an existing machine, must also be capable of evaluating the suitability of the project, guarantying the correct supply of all documents required to attest the work carried out: "one cannot ever expect that an existing machine reach the

> "The complexity of the work requires high-level professional expertise"

▲ New shaftless unwinder unit with hydraulic cylinders for winding line.

safety levels of new machines; nonetheless, that is the objective to be aimed at, as it is unacceptable that an alteration reduce the safety level of any machine, introducing new risks that have not been evaluated or have been underestimated".
Therefore altering, revamping and rebuilding require competencies that allow evaluating the extent to which the work in question impacts the original design parameters of a given machine, proposing and assisting the client in comparing possible alternatives, feasibility and validity and choosing the best solution, organizing and managing the supplies and the activities on the field. It is also necessary to know how to assess, right from the start, all the aspects that regard worker safety and environmental safeguarding, defining structured procedures to file the modification made, assess the respective risks and required safety measures, define supply responsibilities and provide all the documents necessary to certify the solutions adopted in observance with current legislation. ●

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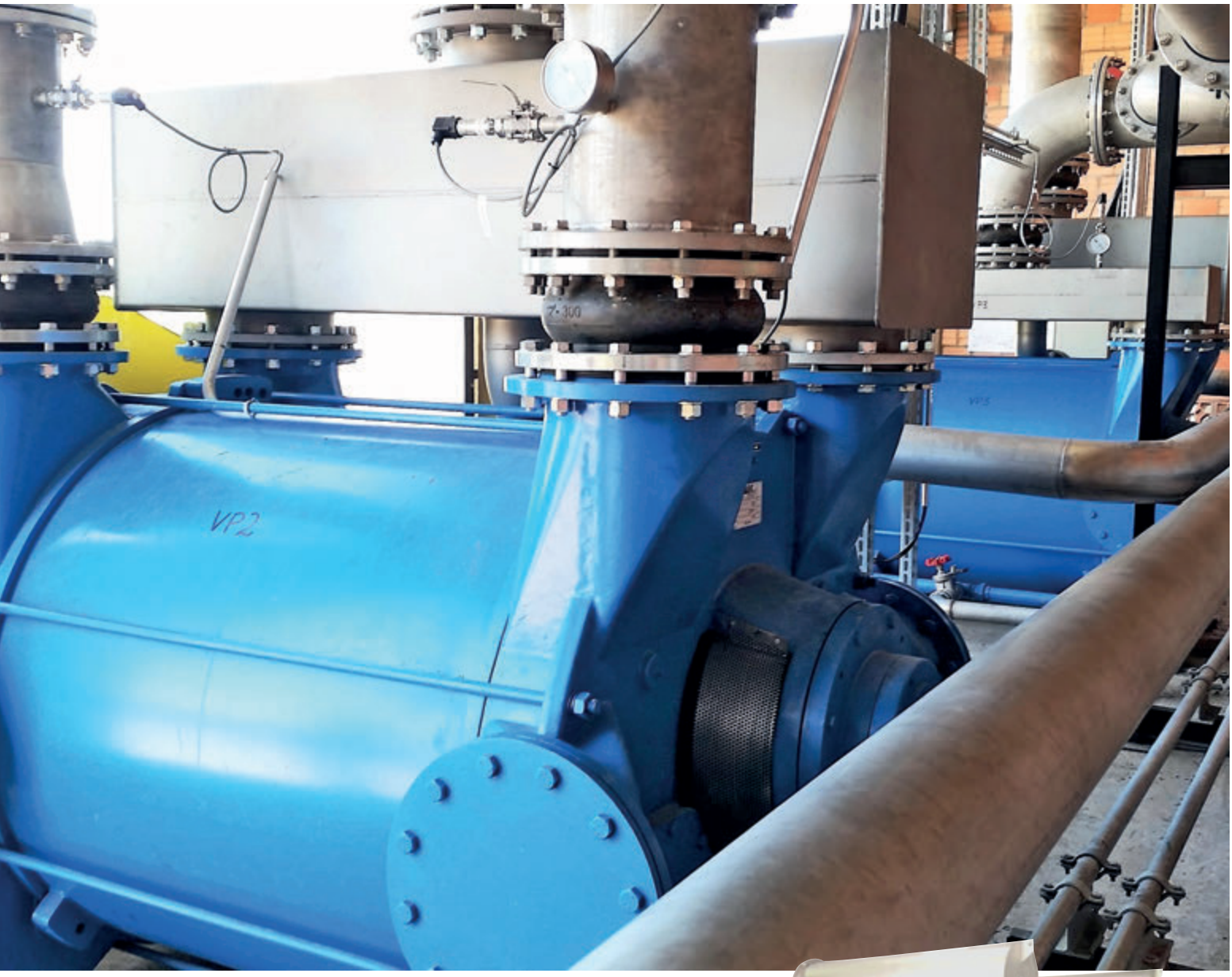
Vacuum plants solutions by AZMEC

The skill and the experience consolidated in 55 years of presence in the market (AZMEC was founded in 1960) say that AZMEC is a serious and available partner for all the companies for the paper mill industry that have to optimize the performances of its own vacuum plant, main part of the paper machine in the production of the paper.

by: TissueMAG

AZMEC is not only proposing its own solutions in new vacuum plants, but allows to the customers, through its overhauling service, to rebuild old pumps working since many years, to the original performances with an accurate revamping operation.
The AZMEC production includes six lines of vacuum pumps, machines available to grant capacities from 150 up to 50.000 mc/h; together with the vacuum pumps, AZMEC offers to the customers all the available accessories that's to say the driving systems (pulleys and V-belts, gear reducers when the installed power is more than 355 kw), the discharge separators, the silencers, the pre-separation groups, the safety valves, the self-priming extraction pumps and the dampers just to mention the main parts.
The vacuum pumps of the range AL/2000 cover a range of capacity from 150 to 12.500 mc/h; the range ALBV/2000 covers a range of capacities from 2000 to 7500 mc/h and the characteristic of these pumps is to have practically two pumps in one due to the presence of an internal wall that creates two sections each of one available to grant the 50% of the total capacity and different vacuum degrees; the same solution, but with horizontal suction nozzles, is granted from the pumps of the range ALZ/2000 have the same range of capacities of the range AL/2000; with the range ALCZ, pumps available to work without and with the internal wall, the capacities reach the maximum of 50.000



mc/h; the range AL-BC grants capacities from 450 up to 17.000 mc/h and the range AL-B4 grants capacities from 4500 up to 21.000 mc/h.
A special care is offered from AZMEC to one of the problems that is present more and more frequently: the reduction of the noise level of the machines according to the laws concerned to the ambient; to get the best solution, AZMEC offers to the customers the covering of the pumps with soundproof panels available to reduce the noise level to 75 dB(A); clearly these

▲ Vacuum pump group ALC500Z and ALC506Z installed in Kartotec plant (Paraguay).

▶ Pump skid ALN40_2000 high vacuum with mechanical seals, in AISI316, with direct coupling and soundproofing cabin.

> AZMEC, 55 years of presence in the market. The production is arranged in the two workshops in Italy

▼ Pump skid AL40_2000 high vacuum on baseplate.

▲ Vacuum pump group ALC420Z on baseplate.

solutions can be applied also on machines already installed.
The AZMEC proposal is not concerned only to the supply of its own machines; AZMEC is offering to the customers a complete service for the best arrangement of the vacuum plant; usually AZMEC is preparing a lay-out of the vacuum plant arranged according to the necessity of space and of installation of the custode just to optimize everything both from a technical view and a logistic view just not have problem in case of maintenance.
Just to go inside the maintenances, AZMEC overhauls not only its own machines but also the competition pumps; all the pumps are sent back with the due guarantee and with the test data available to confirm the right operating; to check the eventual necessity to arrange a maintenance, AZMEC can be present with its technicians near the customer workshop to do the measures of capacity, vacuum degree and absorbed power of the vacuum pumps present in the plant.
Usually, AZMEC supply to the customers a spare pump so that the production has not to be stopped during the repairing of the other pump.
It's important to mention the last and very important supplies made recently from AZMEC: new vacuum plant to the company KARTOTECH in Paraguay (n. 1 pump ALC506Z inox + n. 1 pump ALC500Z inox); two new vacuum plants for PM1 and PM2 to CHANDARYA in Kenya (n.4 pumps AL22/2000 + n. 2 pumps ALBV55/2000); ANDRITZ Austria (n. 4 pumps ALC 530 + n. 2 ALBV 95/2000) with final destination Japan; SENECHAL in France (n. 4 pumps AL 22/2000); ENEL in Italy (n. 2 complete turn-key skids AL120/2000, n. 3 complete turn-key skids AL 95/2000) for the Energy plant in Pietrafitta, Porto Corsini, Termini Imerese, Priolo Gargallo and Arezzo; COPASA Spain (n.2 pumps ALC520Z + n. 1 pump AL 120/2000) with final destination Bolivia; ANDRITZ Austria (n. 2 ALC 520Z + n. 1 ALC400Z) with final destination Bangladesh.
The production is arranged in the two Italian workshops in Genova Voltri and in Verderio (LC) where the vacuum pumps are manufactured through the utilization of CNC tool machines and tested in the new certified test room.
AZMEC is working according to the rules ISO 9001 and its target is to offer a more and more complete service to the customers, depending to the consolidated quality of its own products and to the efficiency of its staff. ●

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Amotek bagger.

The Italian manufacturer of **packaging machines** based in Bologna

AMOTEK, established in 1977, is located in Zola Predosa near to Bologna (Italy), the leading area for the automatic packaging industries and the Italian Packaging Valley.

by: TissueMAG

Bags trolley.

Since January 1999, Amotek is part of the OPTIMA packaging group GmbH where Italian commitment to research and innovation, together with German tradition and technical knowledge made such a challenge to all markets possible. Amotek, leader in the sector of automatic packaging machines for tissue products since 1977 and with over 1000 machines already installed worldwide, is constantly increasing its presence and penetration on markets worldwide.

40 years of experience

Since more than 40 years, Amotek designs and manufactures horizontal automatic bagging machines and complete packaging lines. Investing in research, development and innovation allows Amotek to propose a vast range of highly versatile easy to operate and as well high-tech automatic machines suitable for bagging different products as, for instance, toilet and kitchen rolls, sanitary napkins, baby and adult diapers, dustbin bags etc.

Packaging philosophy

Amotek machines, may pack single or multiple products into bags from tubular, flat, centerfolded film or pre-made bags. The bags obtainable from the

machines may be in different styles like with carrier handle or finger hole, bottom and/or top gussetts, closure with twist as well as with reclosable profiles. Thanks to their operation flexibility, the Amotek machines may be automatically coupled to any production line or independently operated as single unit. As undoubted result of such precise activity is the series of Amotek top level product model PB182 for toilet and kitchen rolls that have been restyled during the last couple of years by offering new models, variants, optional or simply better performing copies, to follow specific production needs of any Amotek Customer.
Amotek Model PB182 is the top level fully automatic bagging machine for tissue rolls offering the possibility to work by both single and double lane configuration products so to have the possibility to double production capabilities in terms of packs output per minute. This, accepting up to 6 lanes infeed of single products from the log saw.
The easy and quick changeover time requested to shift from single to double lane and vice versa, is one of the main features of the whole Amotek PB182 bag fillers range.
It came as the result of the profound know-how and long experience gained in direct contact with the end-users as witnessed by the number of machines already successfully working worldwide. PB182 is the trustful response to the current users demand of high performance together with maximum versatility. Suffix PB means Pre-Made bag that is the Packaging Material for which the machine is designed for. Positioned at the end of the converting line its feeder module receive Tissue Rolls coming from 4, 5 or 6 infeed lanes. Rolls can be then turned upside down or left as they come from the log saw. Switch between single and double lane is tool-free.
The PB182 Bag filling machine is available in different versions to meet customers' needs: PB182 up to 6 lanes; PB182-LS 5 lanes; PB182-LS 4 lanes.
In addition, Amotek is proud to offer the latest technology based on IS220FT and PB169 series, suitable for the packaging of interfolded facial tissue and cake tissue rolls in premade bags. These models are highly flexible as capable to offer different feeding units according to product orientation. It is thanks to all these innovations that Amotek is continuously improving the offer capabilities giving to Customers precise answers after precise request. This, permitting to Amotek to strengthen position on every Market. Keys of success are rapidity, flexibility, products range and valuable options. ●


HMI panel.

> "Amotek is leader in the sector of automatic packaging machines for tissue products"


Infeed belt.

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TISSUE Hot Spots and Trends

By: Pirkko Petäjä, Principal at Pöyry Management Consulting

Tissue Industry Trends in Europe

Consolidation is a clear trend in the European tissue industry; the large producers have been growing through sizeable acquisitions as well as by organic growth. The capacity share of the three largest players has grown from approximately 40% to 50% in the last some 15 years while the market has grown 1.5-fold over the same period.

Market consolidation has also increased due to expansion of middle size and smallish players that have strongly participated to the growth.

An opposite trend to the industry consolidation is the **entry of newcomers**. The tissue growth is not only by expansion of existing players, but there is versatile motivation for new type of tissue paper producer entrants. The new entrants mostly increase the fragmentation of the industry as they often are relatively small players. Some new entrants are at least partially motivated by push or decline of their current businesses such as smaller pulp mills losing their competitiveness and integrating to tissue or graphic paper sites looking for new opportunity due to their declining market.

Tissue trends include also **new geographic orientation**; tissue in Europe has typically been relatively local or regional business, but along with the growth of the players the wider geographic spread has become a trend. Especially the private label players have earlier spread with their retailer clients all over in Europe. Now they have also new geographic interests.

There has been a tendency to follow the European retailers and look for opportunities especially in North America.

SCA and Sofidel have made concrete moves in the North American soil through recent M&A and also through organic growth.

In addition SCA has made focused expansion in China trimming at the same time some more marginal regions from its global footprint.

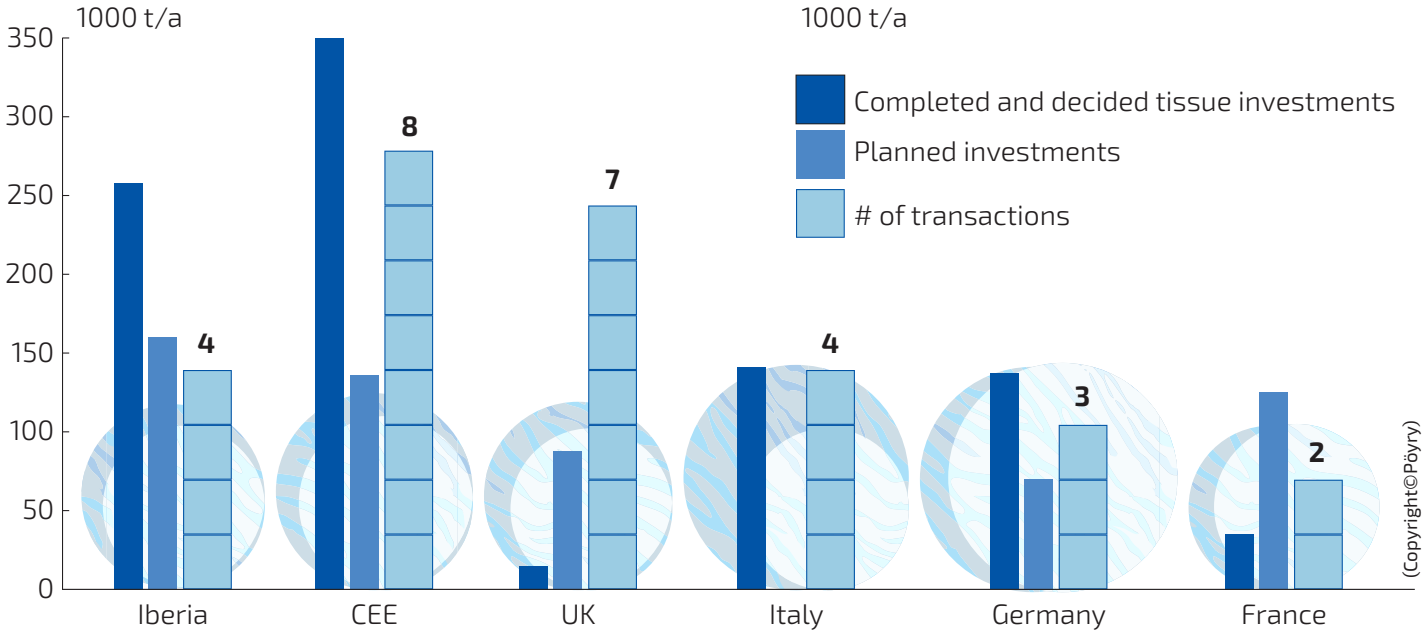
The **product and quality trends move between North America and Europe** together with the increasing European invasion to the new world.

Outside Europe, in Turkey and other MENA area a clear trend is to reach more out from the local and regional markets for instance by increasing jumbo reel exports. This is caused by the strong growth of the local capacity that exceeds the demand growth.

Jumbo reel export targets are especially the UK and from Turkey also Israel and Greece (***Figure 1***).

FIGURE 1 – HOT SPOTS IN EUROPEAN TISSUE

In the last few years completed and decided tissue capacity investments have concentrated on Iberian Peninsula and Central Eastern Europe. Also planned investments are there the highest. Transaction activity has concentrated in CEE and the UK.



Bubble size reflects Finished Products demand 2015 (ktons) and Jumbo Reel production 2015 (ktons)

FIGURE 3 - COMPLETED, PLANNED AND INTENDED TISSUE PROJECTS 2016

Western Europe

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County	Group	Company	Site	1000 t/a	Year	Qtr	Status	Description
Austria	Norske Skog	Norske Skog Bruck GmbH	Bruck an der Mur	65	2017	4	Planned	new PM
France	SCA	SCA Hygiene Products S.A.	Hondouville	-25	2017	..	Decided	shut-down
	ICT - Industrie Cartarie Tronchetti	Industrie Cartarie Tronchetti	Montargis	65	2018	..	Intended	new PM
	Sofidel	Delipapier S.A.S.	Ingrandes	60	2019	..	Intended	new PM
Germany	Metsä Group	Metsä Tissue GmbH	Raubach	10	2016	2	Completed	rebuild
		Fripa Papierfabrik Albert Friedrich KG	Miltenberg	35	2018	..	Intended	new PM
Greece		Maxi Paper Mill	Katerini	28	2017	..	Planned	new PM
Italy	Lucart Group	Lucart S.p.A.	Porcari	10	2016	1	Completed	rebuild
	Eurovast S.p.A.	Cartiera Eurotec srl	Fabbriche di Vallico	18	2016	3	Completed	restart PM
Portugal		Paper Prime S.A.	Vila Velha de Rodão	35	2016	4	Completed	new PM
		Renova - Fabrica de Papel do Almonda S.A.	Zibreira, Torres Novas	30	2016	4	Completed	new PM/NTT
	The Navigator Company	Portucel - Empresa Produtora de Pasta e Papel S.A.	Cacia	65	2018	..	Planned	new PM
Spain	Cominter Group	Cominter Tisú	Hernani	16	2016	1	Completed	restart PM
		Isma 2000 S.A.	La Torre de Claramunt, Barcelona	25	2016	1	Completed	rebuild
	SCA	SCA Hygiene Paper España S.L.	Mediona	-20	2016	3	Completed	shut-down
	SCA	SCA Hygiene Paper España S.L.	Mediona	-25	2016	3	Completed	shut-down
		Gomà-Camps Consumer, SLU	Ejea de los Caballeros	32	2018	2	Decided	new PM
	ICT - Industrie Cartarie Tronchetti	ICT Iberica	El Burgo de Ebro	65	2018	..	Planned	new PM
	Sofidel	Ibertissue S.L.U	Bunuel	30	2019	..	Planned	new PM
United Kingdom		Accrol Papers Ltd	Blackburn	60	2017	..	Planned	new PM
	SCA	SCA Hygiene Products UK Ltd.	Stubbins Ramsbottom	-20	2017	..	Planned	new PM
	SCA	SCA Hygiene Products UK Ltd.	Skelmersdale	28	2018	..	Planned	new PM/TAD

Tissue Hot Spots

By 2025 the tissue market in Europe is estimated to grow as an average some 2,1%/a, driven by Eastern European growth at annual rate of 4,4% while the Western European growth is estimated to continue at rather modest pace of 1,5%/a. (the numbers exclude Russia where the situation is still evening out after the impacts of the political turmoil). The activity in the markets follows to some extent the market growth - but there are some clear Hot Spots in Europe that for various reasons especially interest the different stakeholders (not necessarily directly related to the strongest market growth). Regarding capacity increase and plans since 2014 there are two clear Hot Spots in Europe - most of the recent tissue **capacity investments** have taken place or are planned in **Central Eastern Europe and in the Iberian Peninsula**.

In the Iberian Peninsula the brisk investment activity is partially driven by the after the long recession finally improving economy. Some of the investments are new type of entrants motivated by the fiber integration related cost benefits and due to the smallish Euca pulp mills losing their competitiveness as market pulp mills. In Iberia there are also a few transactions related to the growth aspirations.

Regarding various tissue related acquisitions and deals there are two Hot Spots; in the last some four years eight **transactions** are recorded in **Central Eastern Europe** and seven have taken place in **the UK**.

The Central Eastern European consolidation and growth is boosted by various acquisitions where the new owners, often for instance financial buyers help to develop the industry. In the UK the transactions include several cases where the independent converters are being acquired by producers looking for market share or faster entry to the markets (***Figure 2***).

FIGURE 4 - COMPLETED, PLANNED AND INTENDED TISSUE PROJECTS 2016

Eastern Europe

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Country	Group	Company	Site	1000 t/a	Year	Qtr	Status	Description
Azerbaijan		Caspian Industry and Development Corporation	Baku	30	2018	..	Planned	new PM
Bosnia-Herzegovina		Violeta Ltd.	Livno	25	2019	..	Intended	new PM
Czech Republic		Novak-Papirsto	Perva, Slavetion	10	2016	4	Completed	new PM
		BOR Biotechnology, a.s.	Kozomín	28	2018	..	Planned	new PM
Estonia	Tolaram Group	Horizon Tissue OÜ	Kehra	12	2019	..	Intended	new PM
Poland		W. Lewandovski	Wlocknen	20	2016	1	Completed	new PM
	WEPA	WEPA Professional Piechowice S.A.	Piechowice	32	2017	1	Completed	new PM
	Sofidel	Delitissue Sp. z o.o.	Ciechanow	70	2017	4	Decided	new PM/NTT
		Zakad poligraficzny POL-MAK	Ziemowita	25	2017	3	Planned	new PM
		Velvet care Sp.	Klucze, Katowice	65	2018	..	Intended	new PM
		Fabryka Papieru i Tektury Beskidy S.A.	Wadowice	30	2018	..	Intended	new PM
Russia		Syassky Pulp and Paper Mill	Syasstroj	-23	2016	2	Completed	shut-down
		Syassky Pulp and Paper Mill	Syasstroj	40	2016	2	Completed	new PM
	Pulp Mill Holding	OOO Arkhbum Tissue Group	Vorsino	70	2018	3	Decided	new PM
	Pulp Mill Holding	OOO Arkhbum Tissue Group	Vorsino	70	2021	..	Intended	new PM
Serbia		Drenik	Belgrade	10	2016	4	Completed	rebuild
Ukraine		OAO Kohavinskaya Paper Mill	Gnezdytsev	15	2016	4	Completed	rebuild
	Pulp Mill Holding	PJSC Kiev Cardboard and Paper Mill	Obukhov	5	2016	4	Completed	rebuild
		JSC Ukrpapirinvest (UPI Group)	Kharkov	20	2019	..	Intended	new PM
		Donetsk-Vtorma PLC	Donetsk	11	2020	11	Intended	new PM

FIGURE 5 - COMPLETED, PLANNED AND INTENDED TISSUE PROJECTS 2016

MENA

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Country	Group	Company	Site	1000 t/a	Year	Qtr	Status	Description
Egypt	Hayat Holding	Hayat Kimya	Ain Sokhna	65	2016	4	Completed	new PM
		Alex Converta Co. SAE (Handy)	New Amrya	25	2018	..	Planned	new PM
Saudi Arabia		Al Faris Industrial Group	Faris	20	2016	4	Completed	new PM
		Gulf Paper Industries Factory Co. Ltd.	Riyadh	60	2017	2	Planned	new PM
Turkey	Aktül	AK GIDA SAN ve TIC A.S.	Pamukova	65	2016	1	Completed	new PM
		EKA Industrial Paper Production Limited	Köseköy, near Izmit	38	2017	..	Planned	new PM
		Tezol Tütün ve Kagit San. Tic. A.S.	Torbali	11	2018	..	Planned	new PM
United Arab Emirates	Nuqul	Fine Hygienic Holding	Abu Dhabi	60	2017	3	Decided	new PM
		Crown Paper Mill Ltd.	Abu Dhabi	65	2018	..	Planned	new PM
		QUEENEX Hygiene Paper Manufacturing LLC	Abu Dhabi	60	2018	..	Intended	new PM

European and North American trends are mixed

Along with the new geographic orientation and the European players probing the North American markets, the product and quality trends are being exchanged between the regions. In both areas there is an **increasing demand for premium quality** (bulkiness, softness, absorbency). Premium tissue share is largest in North America and not at the same level in Europe, but growing. In both markets this reflects in the popularity of **improved quality paper machines**, especially in North America, but also in Europe. North America has seen a new boom of **TAD** machines and interest in **ATMOS/NTT**, but also Europe is getting one new TAD machine that has not happened in decades, and a few NTT machines are coming on stream as well. Still; the share of the advanced machines in North America is some 35% while in Europe it is about 5%. Shares in new machines deviate from this. Typically in Europe the quality has been made more with converting than with the paper machine, while in North America the base paper has been determining the tissue quality and converting, number of plies, embossing etc. has had much less importance. The trend is **changing the practices in North America** rather than vice versa. The multiply color-glue laminated decorative embossed products have existed in Europe longer and will maintain their position. Colored tissue is a relatively small portion of the market, but colored is more common in Europe than in North America. Napkins are the most typical category in web colored, especially when used in special occasions, but also Renova's type of deep color in other categories is spreading from Europe.

The increasing quality trend favors virgin fiber based premium products. The virgin fiber based furnish is increasing also due to availability issues with high quality recovered fiber and deteriorating economic advantage of the recovered fiber content. It is not reasonable to build new DIP capacity for tissue. As tissue capacity increases while the DIP capacity remains stagnant **the RCF share in tissue furnish is declining**. The European type of production makes it way to North America with the European players following the discounters, such as Aldi and Lidl, in their attempts to conquest America. With this development the private label share in North America is expected to grow. From North America to Europe come the bulk packs and large rolls and other innovative product and packing types. Years ago especially P&G tried to conquer the European market with the American type of branded TAD products; it partially succeeded in the UK, and left some 'American flavor' to the UK markets. However, European market stayed basically different and P&G decided to withdraw from Europe. However, the North American impact is still seen especially in the UK. The quality and product innovations are an important way to boost growth especially in the mature markets. Exchange between regions ensures the leverage of the best ideas (***Figure 3, 4, 5***). ●

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Today, SENNING is a medium-sized mechanical engineering company with more than 90 employees in its headquarters in Bremen, Germany. The family business is managed in the third generation. More than 85% of SENNING machines are exported worldwide.
SENNING implements customer-individual wrapping machines for napkins, facials, hand towels and non-woven products as well as complete production lines for handkerchiefs with highest precision, individual format sizes and a variable performance range. The current SENNING portfolio includes state-of-the-art machinery, equipped with the latest generation of selected components from first-class suppliers, like Siemens, Schneider, etc. SENNING continuously develops its machinery for the benefit of its customers. The technical creativity of SENNING engineers as well as a great deal of feeling for the products wrapped by SENNING machines is the trademark of SENNING.

Wrapping Machines for napkins, facials, hand towels and non-woven products for all requirements

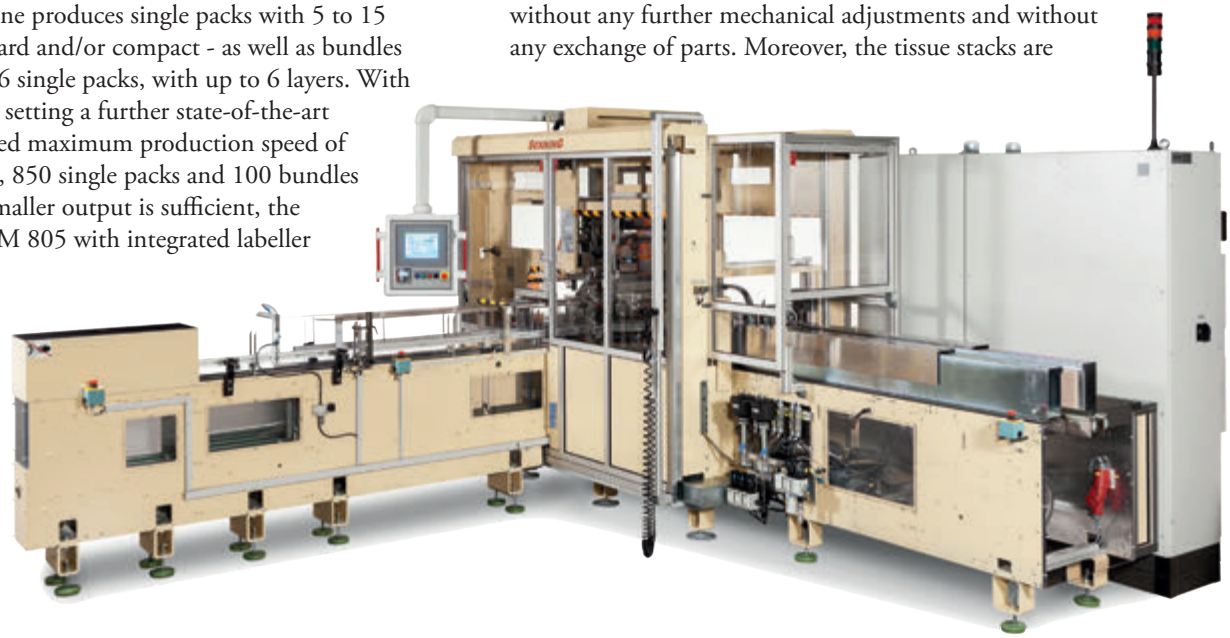
SENNING provides wrapping machines for all demands of their customers: the Wrapping Machine SE 662 delivers fully automatic, highly efficient wrapping of lunch-, dinner- and cocktail-napkins, facial tissues, hand towels and non-woven products with up to 60 packs per minute in printed or unprinted film or paper.
The SE 662 with its clean design satisfies customers' demand regarding availability and productivity.
In case a higher performance is required, the Wrapping Machine SE 660 is available, for extremely flexible, fully automatic, high performance wrapping of lunch-, dinner- and cocktail-napkins, facial tissues, hand towels and non-woven products with up to 100 packs per minute in printed or unprinted film or paper. The robust SE 660 satisfies the most demanding requirements regarding flexibility, reliability and efficiency.
For wrapping single and multiple stacks in printed or unprinted film or paper, SENNING provides the types SE 662 D or SE 660 D, depending on the required output. For each wrapping machine, SENNING provides a wide range of options, such as labeler, thermo-transfer printer or cardboard feeding system. There are further options, e.g. regarding the film perforation - SENNING customers can choose between standard perforation and different forms of special perforations.

SENNING is internationally known for folded paper and tissue products and ensures highest quality and innovation, reliability and service. For almost 70 years, SENNING is one of the world market leaders in the field of wrapping machines.

by: TissueMAG

High-performance Handkerchief Lines from a single source

Currently, SENNING presents the new generation of fully automatic handkerchief lines Made in Germany. The latest development by SENNING - the Handkerchief line, consisting of Production Machine S.PM 820, Labeller DPS 4.2 or Taping Machine SGT 2.1 and Bundling Machine 660 TG, provides handkerchiefs at a high performance level and with the highest flexibility as well. SENNING guarantees the handling of tissue with 2 to 4 plies. The line produces single packs with 5 to 15 tissues per pack - standard and/or compact - as well as bundles starting from 2 up to 96 single packs, with up to 6 layers. With this line, SENNING is setting a further state-of-the-art standard. The guaranteed maximum production speed of the line is 8.000 tissues, 850 single packs and 100 bundles per minute. In case a smaller output is sufficient, the Handkerchief Line S.PM 805 with integrated labeller or taping unit and the Bundling Machines 662 TG or 660 TG-70, with a maximum guaranteed production speed of 4.000 tissues, 450 single packs and 75 handkerchief bundles per minute is available. Both lines provide optimum access and are very user-friendly. The operating panel is equipped with non-verbal pictograms which are intuitively understandable. Only one operator is necessary for the whole line. Another interesting function is the change of counts per single pack by push button, without any further mechanical adjustments and without any exchange of parts. Moreover, the tissue stacks are



▶ Wrapping Machine SE 660.

▼ Wrapping Machine SE 662.

> SENNING offers complete solutions from one source, which stand for reliable and innovative German technology

conveyed by pushers in a controlled way, so that the stacks are not compressed during transportation through the line and thus, the stack volume remains unchanged. The complete line is operated by an integrative electrical system. Apart from that, the low need of wear parts is worth mentioning. For each machine, a variety of options is available, such as special perforations of film, appliance of lotion, perfume units, double embossing station, different embossing systems, labelling or taping for reclosable packs and for handkerchief bundles, auto splicing units for film and tissue, and many more. Together with its customers, SENNING develops specific solutions for all requirements concerning machinery, technical applications or product wrapping.

In 2017, another high-performance Handkerchief Line S.PM 805 + 662 TG has been commissioned at a German customers, a well-known producer of tissue products.

SENNING implemented special technical solutions, tailored to the customer's requirements of machine handling and production. With the Handkerchief Lines S.PM 805 + 662 TG and S.PM 820 + DPS 4.2 or SGT 2.1 + 660 TG, SENNING offers complete solutions from one source, which stand for reliable and innovative German technology.

Aftersales Service

After having purchased a SENNING wrapping machine or line, the customers benefit from a comprehensive aftersales service worldwide. Highly qualified technicians and fitters are available for all SENNING customers for several services globally, like maintenance and repair, performance increases, machine overhaul and upgrades. This ensures that a contact person knowing SENNING machines very well is available at customers' site in case of need. Based on an inspection, SENNING offers an overhaul of machine components to considerably increase the efficiency of the machine. Moreover, special "upgrade-kits" for several machines are available. To ensure a continuous and trouble-free production on the highest performance level, SENNING supplies several services in order to reduce considerably the risk of production failure and the probability of an unexpected production downtime. Moreover, SENNING provides on-site training courses for machine operators. ●

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website: www.senning.de

▲ Handkerchief Line S.PM 805 (from the left side).

Quatis

QUALITY IN TISSUE

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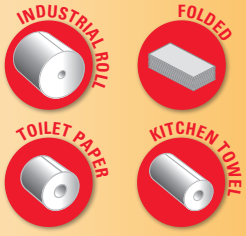
QUALITY INSPECTION MACHINES FOR YOUR EXCELLENCE

Quatis

QUALITY IN TISSUE



DISCOVER MORE

QUATIS FOR UN-WRAPPED TISSUE PRODUCTS

Pulsar ENGINEERING

DISCOVER MORE

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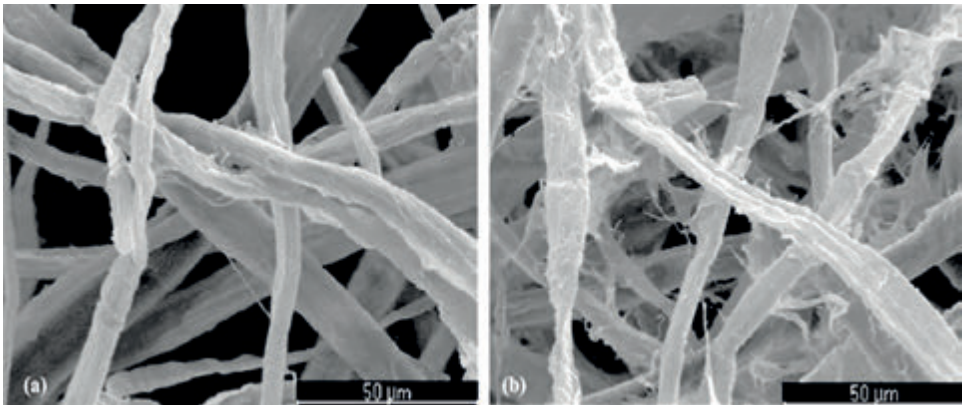

◀ In this picture you can see the effect of enzymatic fibrillation of cellulose, leading to additional contact points between fibres and growing mechanical properties.

Dry and wet strength management in TISSUE MAKING

MARE is a ISO 9000 and ISO 14000 certified company, the biggest privately owned in all Europe, driven by ethics and a true win-win-win (supplier-customer-environment) approach. Our genuine belief in providing return on investment to our customers rewarded us with a proud history in the production and supplying of functional chemicals for paper, detergents, ceramics, concrete, flame retardants and specialty industries.

by: MARE S.p.A.

Detail of silos where sizing agents and dispersants are stocked in Ossona. The majority of the silos are under remote control.

Dear Reader of TissueMAG,
the purpose of this article is to introduce to you our group of companies and our capability to support our customers with their everyday needs and development plans. A considerable part of this paper will then cover the skills MARE has developed regarding dry and wet strength management in tissue making. Our headquarters are located in Ossona, Milan area, where every year we make available for our customers about 220.000 tons of functional aids such as akd and rosin sizing agents, calcium stearate, polyacrilates, PAC and, specific for tissue making, MARESIN wet strength resin and MARECOAT yankee coating agents. Our production site in Veneri, Tuscany (MARE DYNAMICS) produces and supplies about 10.000 tons of specialty chemicals (full yankee coating programs, dry and wet strength management, softeners, wire and felt passivation and cleaning, process and waste water and sludge treatment, deposit control, antifoam, boilout and machine frame cleaning, boiler chemicals) yearly, with an average stock of 500 tons of chemicals, allowing one of the shortest lead times on the local market, and a workshop equipped with state-of-the-art make-down and dosing equipments.
The italian sites, together with our subsidiaries in Austria, producing carboxymethylcellulose, in Germany, producing ASA sizing aid, and all the other ones located in France, Spain, UK, Scandinavian areas and Poland can support all our customers over the EMEA region.Our employees, in their continual effort to improve existing applications and provide new solutions, have generated an unique combination of expertise, capabilities and chemical programs for several applications in which dry and wet strength tensile strength management of tissue paper plays a major role.

▼ Detail of finished product storage silos with waste water oxidation tank on the left and a 200 cubic meters raw material storage silo. The majority of the silos are under remote control.

Open view of Ossona's solar panels providing 1 Mw power to the facilities.

Dear Reader, as you perfectly know, tensile strength management is a strategic factor in tissue making, impacting important marketing, cost and productivity aspects of your company. In this very moment MARE technical personnel can provide you with all the possible solutions existing on the market for mechanical properties control, going from, of course, wet strength resin, which is our core business, through anionic cofactors such as carboxymethylcellulose (NIKLACELL), polymeric resin fixative and temporary wet strength (MAREBOND) and anionic starch down to our high yield concentrated Cellulase enzyme products (MAREZYME). Our technical staff is prepared and equipped to select the chemical program which best suits your needs and process features and to support you with on-site assistance and a proper equipment, when needed, to apply the selected additives.
The number of successful trials we have performed and applications we have consolidated is now relevant and allow us to advocate our proposals with detailed and significant case histories, a part of those you will find described in the following lines.

▲ Detail of gas chromatography/mass spectrometer and FT-IR used in Ossona lab to provide analytical support to Mare customers.

Case History 1

MAREZYME 2135 enzymatic Cellulase aid was applied on Crescent Former Machine while producing 18 gsm kitchen towel from virgin pulp at 1550 m/min yankee speed. The product was applied 0,01% on both softwood and hardwood pulper. Once MAREZYME action was developed, it was possible to change the paper recipe from 70/30 hardwood/softwood to 70/20/10 hardwood/converting rejects/softwood, reduce cationic starch dosage from 6 kg/ton to 3 kg/ton, reduce average refining energy by 12%. The only drawback was an increase of MARESIN dosage by 10%. Return on investment was definitely huge.

Case History 2

MAREBOND B 1000 anionic cofactor was applied 0,13%-0,15% on a Crescent Former machine while producing various ws grades from virgin pulp at 1550-1600 m/min yankee speed. As a result an increase in 35%-40% of wet tensile strength in both machine and cross direction was obtained, resulting in a reduction of 25%-35% in the dosage of wet strength resin. Dry tensile increased by 15-20% in both directions of the tissue sheet, allowing a decrease between 10% and 20% of the refining energy and, in one case, the increase of +30 m/min of the yankee speed.

Case History 3

MARECOAT DS 02 cationic starch was applied 0,6% in the machine chests of a Crescent Former tissue machine, equipped with two refiners in sequence on the softwood line, while producing toilet paper 16,5 gsm from virgin pulp. Dry tensile boosted +60% over target, then one of the two refiners was switched off obtaining tissue paper with the same tensile properties obtained in normal conditions with two refiners on. The mill exploited this result to improve the dispersibility of toilet paper.

Case History 4

NIKLACELL P 70 UC carboxymethylcellulose and MARECOAT DS 02 cationic starch were applied, respectively 0,2% in the pulper and 0,6% in the machine chest, on a twin wire machine, equipped with one stock preparation refiner and one approach system refiner, producing kitchen towel at 1100 m/min from virgin pulp. An increase in tensile strength of +30% in both testing directions was observed and exploited to switch off completely the

▲ Global view of Ossona's R&D laboratory.

Raw materials silos in Ossona.

approach system refiner. Refining energy went then down by 50%, hoods temperature was decreased by 120°C while maintaining tissue tensile, moisture and machine speed.

Case History 5

MAREZYME 2135 enzymatic Cellulase aid was applied 0,01% in the pulper of a Breast roll machine while producing toilet paper at 17 gsm, 1060 m/min yankee speed. Thanks to the reported increase in tensile strength the softwood/hardwood ratio was changed from 30/70 to 20/80 and refining energy was reduced by 10%, still having +20% tensile in the tissue sheet. On the same machine, the addition of 0,01% MAREZYME 2135 on kitchen towel 17,5 gsm, 1010 m/min yankee speed, allowed an increase of yankee speed +50 m/min with tensile data still over standard values.

Case History 6

NIKLACELL P 70 UC carboxymethylcellulose and MARECOAT DS 02 cationic starch were applied, respectively 0,18% in the pulper dump chest and 0,70% in the machine chest, while producing kitchen towel 23 gsm at 1150 m/min. A +30% increase in tensile properties allowed the mill to increase the speed of the machine +80 m/min, and +30 m/min on kitchen towel 19 gsm.

Dear TissueMAG Reader, we hope that these few lines succeeded in describing how MARE can help you with primary issues such as mechanical properties management and we are sincerely looking forward to have the chance to talk with you face to face about this topic and any eventual subject you may be interested in. Thanks for your time, MARE employees. ●

> “Tensile strength management is a strategic factor in tissue making”

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Performance improvement with tissue machines through tisQ.Xw roll cover technology

Drying the tissue paper web with the heated Yankee cylinder and the hot air hood is a very energy-intensive process.

by: Dipl. - Ing. (FH) Torsten Bellaire, Application Engineering SchäferRolls

Considering the constant growth in energy costs, all efforts are made to reduce energy consumption by enhancing mechanical dewatering. Tissue producers can benefit directly from reduced energy costs by raising the level of dry content after the pressing process and thus enhancing the efficiency of the complete Yankee machine. Pressure and suction pressure rolls are designed to dewater the paper web as efficiently and gently as possible. Yet the roll covers are used in very difficult operating conditions, creating certain challenges defining the optimal nip geometry of the roll covers, primarily due to the extreme diameter/length ratio of the Yankee cylinder, the related dynamic deformation of the cylinder under internal steam pressure, temperature and linear loads. Low roll diameters and high operating speeds witnessed in modern tissue machines result in high linear loads and nip frequencies. As a consequence, the roll covers are exposed to extreme thermodynamic loads. Roll covers used in the manufacturing of tissue products thus have to be designed to ensure maximum service life, stability and consistent quality considering elasticity, resilience and even CMD (cross machine direction) profile.

Suction pressure rolls in Yankee machines do the lion's share of the work when it comes to the mechanical dewatering of the tissue web. As a result, they are pivotal to energy savings and thus directly affect the overall performance of the production system. Thus, a few key features are important when selecting a roll cover.

▲ SchäferRolls GmbH headquarters in Renningen.

FIGURE 1 - tisQ.X suction pressure roll cover.

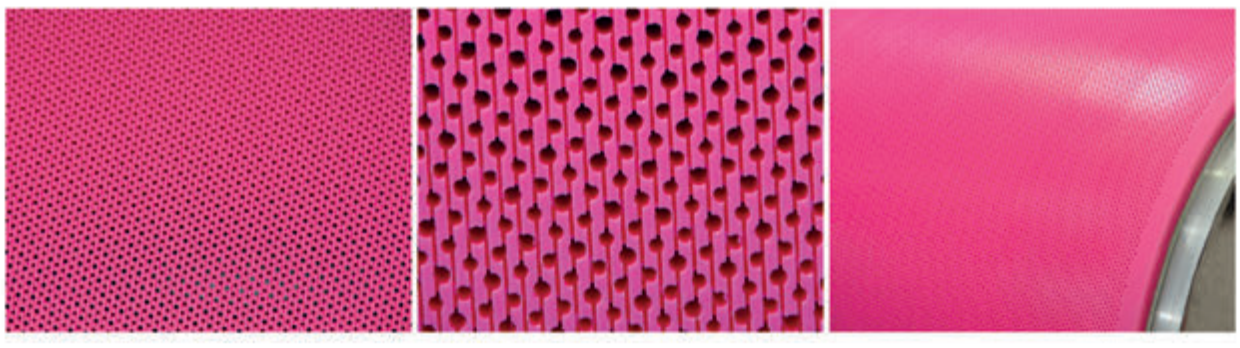
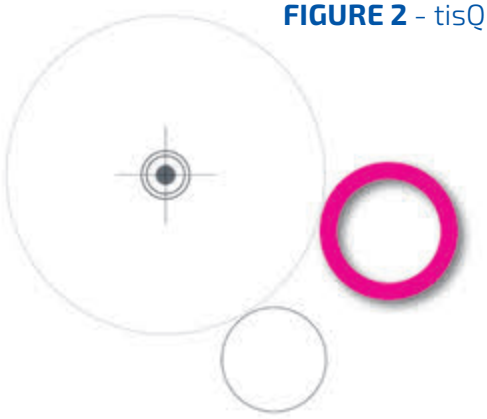
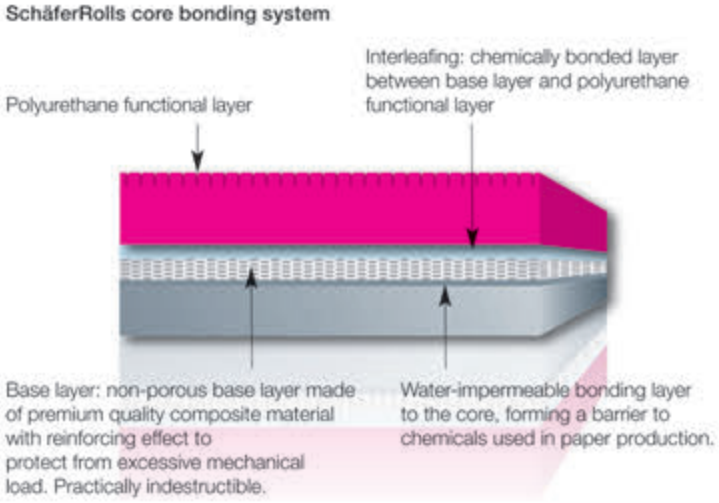


FIGURE 2 - tisQ.X - characteristics and cover design.



→ tisQ.X for suction pressure rolls

- Hardness 20 – 30 P&J
- Outstanding dynamic stability and elasticity
- High abrasion resistance
- For very open surface designs for maximum dewatering performance
- Surface designs: blind and suction holes, grooving



> “tisQ.X: a considerable improvement to the machine efficiency in the manufacturing of tissue”

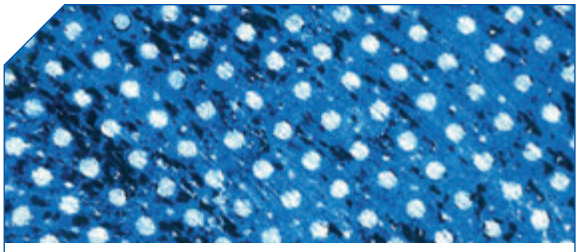


FIGURE 3 - Surface impression of the rubber suction pressure roll.

First: high water storage capacity, achieved with optimised surface designs with high open surfaces and high void volumes. Second: sufficient nip widths for gentle dewatering. And third: abrasion resistance for longer service life and stable operating conditions. SchäferRolls has developed the tisQ.X suction pressure roll cover especially for fastrunning tissue machines designed to achieve ultimate dewatering performance and energy efficiency. tisQ.X covers are designed to deliver maximum resistance to moisture, temperature and wear. They are also suited to maximum linear loads and speeds. The polyurethane compound developed for tisQ.X suction pressure rolls offers unparalleled mechanical, dynamic and chemical stability. Thanks to the outstanding resilience of the functional layer, the roll cover is suitable for all surface designs (blind and suction holes, grooving) without compromising the stability of the cover surface. All of this allows for variable surface designs, which come into their own in terms of increased void volumes coupled with short dewatering paths. Ultimately, this results in highly efficient dewatering – creating extra potential to improve dry content and operating speeds, and thus increase machine efficiency (***Figure 1*** and ***2***).

Through the use of a tisQ.X suction pressure roll cover with optimised surface design, the machine and dewatering performance of the PM10 were increased significantly at WEPA Leuna GmbH. The PM 10 in Leuna produces mainly toilet paper (70%) and kitchen towel paper (30%) at a speed of 1,800 to 1,950 m/min on a work width of 5,500 mm. The weight range is between 15.4 and 18 g/m².
At WEPA Leuna, the aim was to achieve an increase in dry content through improved mechanical dewatering with the suction pressure roll, in order to achieve additional energy savings. As there were no problems in the previously used blind

FIGURE 4 - Comparison of open surface and void volume of standard rubber cover and tisQ.X.

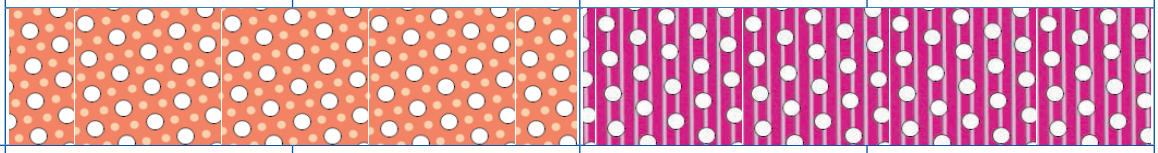
	Standard rubber cover		tisQ.X cover	
Surface design suction pressure roll cover	Blind drilling: 2.0 mm Suction drilling: 4.0 mm Grooving: -		Blind drilling - Suction drilling: 4.0 mm Grooving: groove width: 0.8 mm groove depth: 2.8 mm land width: 2.5 mm	
				
	Open surface	Void volume	Open surface	Void volume
Blind drilling	9.95%	383 ml/m²	-	-
Suction drilling	19.9%	680 ml/m²	19.9%	680 ml/m²
Grooving	-	-	24.2%	679 ml/m²
Total	29.8%	1063 ml/m²	39.3%	1223 ml/m²

FIGURE 5 - Surface of tisQ.X suction pressure roll cover after 413 days of running time.

and suction drilled standard rubber covers with regard to cross profile irregularities or lifetime, additional potential could be achieved by increasing the dewatering performance by optimising the surface design by applying a groove instead of the previous blind drill hole. Due to its excellent mechanical surface stability, the tisQ.X polyurethane suction pressure roll cover provides the best prerequisites for this. To determine the final surface design, SchäferRolls Application Engineering performed a complete machine analysis on site, including a surface impression of the design of the rubber suction pressure roll in use (***Figure 3***). Based on the results of the application engineering analysis, with the support of the SchäferRolls SurfaceOptimizer, a software for the configuration and planning of surface design and dewatering performance of roll covers, a new surface design was determined. In comparison to the rubber suction pressure roll cover in use with blind and suction holes, it was shown to the customer that with the tisQ.X cover, in a first step, with a conservative groove design, an increase of from 29.8 to 39.3% in the open surface can be achieved. With this measure, the free void volume is enlarged by approx. 15%, i.e. from 1063 ml/m² to 1223 ml/m² (***Figure 4***). With the changeover to a tisQ.X polyurethane cover, the customer very clearly saw the opportunity of increasing the dewatering performance of the suction pressure roll without major effort and thereby achieving savings with respect to energy costs. After the suction pressure roll with the tisQ.X cover was installed in the PM10 at WEPA Leuna, a dry content increase of 1% oven dryness was determined from 42 to 43% compared to the previously used rubber cover. Even after a running time of a respectable 413 days, the roll cover still makes a good impression, and it is not necessary to grind the surface (***Figure 5***). Prospectively, the roll will be installed again in the machine at the end of the year. At present, the sister roll is in use, which also received a tisQ.X cover, in view of the success. "As the target running time of 12 months has been exceeded, an interval of 18 months is now being aimed for", says Dipl.-Ing. Lars Helge Peters, Mill Manager at WEPA Leuna. Therefore, tisQ.X suction pressure roll covers are making a valuable contribution to the reduction of energy and operating costs and are thereby making a considerable improvement to the machine efficiency in the manufacturing of tissue. ●

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Sandreschi, a tradition rooted in time

Reels.

The Cartonificio Sandreschi cardboard and paper mill was established in 1863 in the valley of Villa Basilica, in the Province of Lucca, an area that was already famous for the production and processing of paper, and in particular straw paper.

by: TissueMAG

The farsighted entrepreneurs of the Sandreschi family, who began the business, were among the first to rely on steam drying cylinders, way back in 1930. The ability to keep abreast of the times, and at times to anticipate them, allowed the company to grow, constantly renewing machinery and production processes in order to market reliable products obtained from recycled materials.
Brothers Ernesto and Benedetto Sandreschi have led the family business for more than thirty years, supporting a development based on a balance between tradition and innovation. The Cartonificio Sandreschi corporate philosophy focuses on long-lasting commercial relationships pivoting on broad scope partnerships. Corporate organization foresees a management in direct touch with the commercial and technical divisions of customers and an efficient B2B, with a staff keen on understanding clients' requirements and meeting their demands.
Today, increasingly on the side of research and development, the corporate mission stresses attention to an environmentally friendly production. This mission has led to the development of ethical processes for both energy sources and production cycles, with particular focus on recycled water and materials, achieving high quality performance that places the company among the leading players in the complex and globalized market of recycled cardboard.

At the service of the paper and packaging world

Cartonificio Sandreschi focuses primarily on the processing of recycled cardboard for the production of line tubes, tissue converting, spiral tubes, textile reels, packaging edge protectors, and special productions such as paper honeycomb, high density tubes, and other applications. Cardboard is produced in weights (grammage) ranging from 180 to 600 grams per square meter; several types of products are available with specific features for each sector of use. Recycled cardboard is cut into strips or reels according to client's needs. The chemical and physical characteristics of each product are carefully studied, based on their final use. Cardboard can also be dyed according to client's requirements. Particular care and attention are paid to the corporate core business, notably the processing of cardboard from recycled waste paper to produce cardboard cores for the tissue industry. Meticulous preparation of the finished product and decades of experience in this

▲ Solar panels.

▼ Manufacturing plant.

field have made a constant presence on the global market possible for this type of recycled cardboard in strips in this important production sector.

An ethical, 100% environmentally friendly production

The cardboard produced is obtained from 100% recycled waste paper. A constant and firm commitment has led to a turning point in the Cartonificio Sandreschi's production regarding the exploitation of natural resources, whereby energy consumption is reduced to almost zero. A new and efficient methane gas cogeneration plant and solar panels over the factory roofs produce electric power and heating to meet company demands, reducing CO2 emissions, - 1722 t CO2/year, and TEP,

> "The corporate mission stresses attention to an environmentally friendly production"

▲ Cogenerator.

▼ Producing reels.

A virtuous cycle

Using recycled raw material
Gas efficiency - Sun energy
Returning pure water

- TEP 759/year; excess energy is supplied to the national power network. Water used for cardboard production is then treated through purifiers that return clean water into the water supply network with zero impact over the local ecosystem. ●

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Our advanced services and automation solutions improve the reliability and performance of your processes. Read more at **valmet.com/NTT.**

Valmet
FORWARD

Multipack, world class machines for the tissue packaging

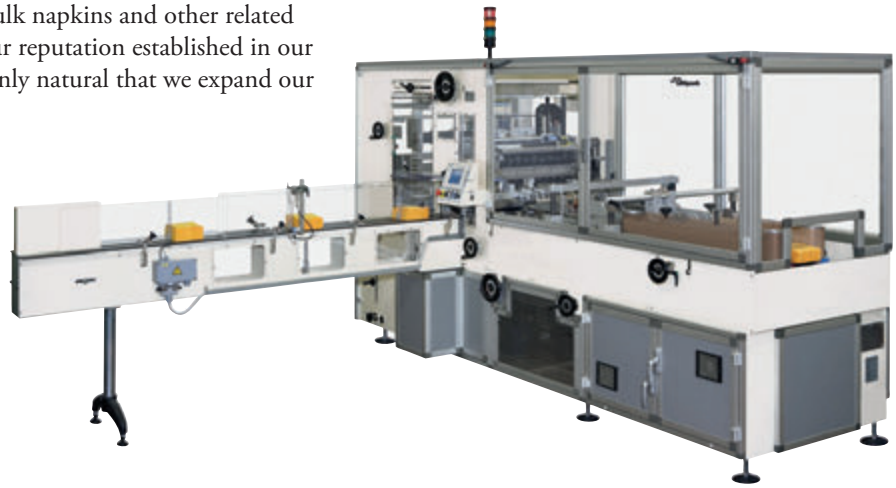
▲ Multipack Headquarters in Casalecchio di Reno, Bologna, Italy.

Multipack Srl of Bologna started producing machines "100% designed and built in Italy" in 1979 for the pharmaceutical, cosmetic and food product markets. With our entry in the napkin market in 1988 we have delivered to date more than 3000 machines.

by: Multipack Srl

A short 3 years ago, under an agreement with our reselling partner, Multipack exited the pharmaceutical and cosmetic packaging markets and we have since then concentrated our efforts on the tissue and towel market by continuing to supply world class machines for the packaging of flat pack and bulk napkins and other related products. With our reputation established in our core market it is only natural that we expand our presence and that leads us to entering in tissue and towel roll wrapping and bundling.

In the past tissue converters, especially large multinationals, might have had lines dedicated to a single product or format or at least lines targeting to a very narrow range of formats to maximize the production capacity of their inherently inflexible assets. In this imperfect world technology constraints forced machine designers to concentrate primarily on reliability at the expense of flexibility to keep capital projects within budget constraints. We have seen several cycles since the 1980's in which some once ubiquitous brands have been absorbed by others or eliminated from the market while others have been born. Advancements in



▶ NK70 - The most sold folded tissue wrapper on the market.

Multipack Sales Team at MIAC exhibition (from left to right: Davide Angelini, Annù Stupazzoni, Egor Krasilnikov, Giuseppe Giusto, Aldo Stupazzoni).

technology, especially electronic motion controls, have allowed designers to improve overall flexibility dramatically without sacrificing reliability allowing converters large and small to provide an ever wider range of products from fewer or even a single production line. In this ever more competitive environment with ever tighter profit margins the machine manufacturers paradigm has had to shift. We at Multipack recognize this shift and in response have been developing our first offering in tissue and roll towel wrapping; the **TEKNA RollEvolution**.

We have been pursuing the development with three primary objectives:

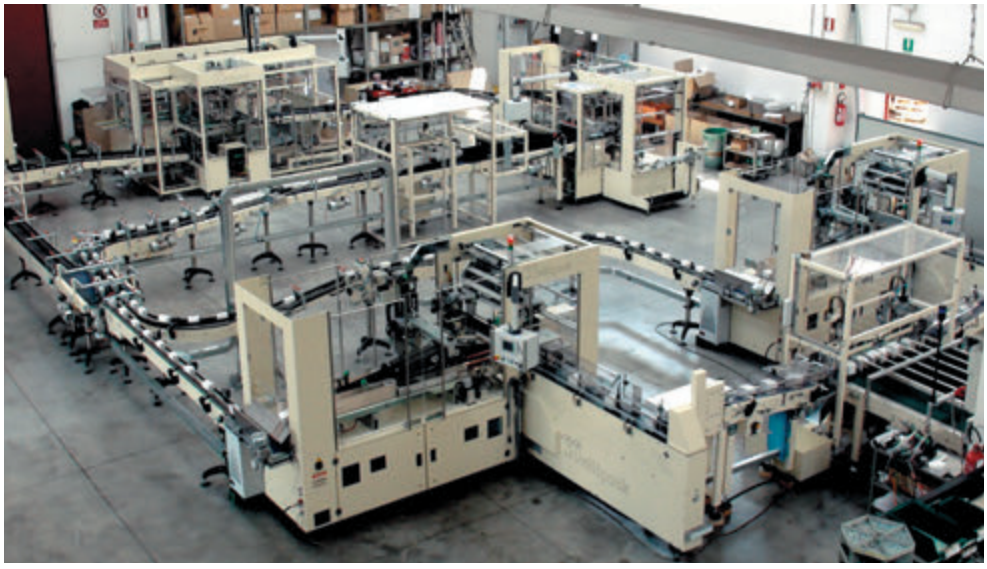
- Minimize format change time and special parts dedicated to formats. This objective is to reduce the format change time to be compatible with the latest advancements in rewinder technology.
- Minimize operator intervention required by format changes. This is to achieve the dual objectives of reducing the incidence of injuries and also increase repeatability by minimizing the possibility of human error.
- Optimize the wrapping cycle by separating processes to increase available machine cycle degrees available to complete critical functions and reduce internal product velocities and process temperatures.

> “Multipack has delivered to date more than 3000 machines”

The **TEKNA RollEvolution** can be considered a hybrid between the currently available reciprocating roll wrapper design, the current crop from market main players which can all trace the same lineage, and our proven NK/TEKNA Flat pack napkin wrapping process. Our efforts have focused primarily on the critical processes performed in the central body of the machine. The overhead carriage system was developed more than 40 years ago to provide a dimensionally stable “box” in which to contain and transport the product and

> “The most striking advancement presented on the TEKNA RollEvolution is a completely new concept for the “overhead carriage” system”

wrapping material during the subsequent folding and sealing operations. Its value has been proven time and time again and it is universally accepted as a best practice. Several iterations are available on the market with varying methods of managing the necessary dimensional changes required during format changes. The most striking advancement presented on the TEKNA RollEvolution is a completely new concept for the “overhead carriage” system. The overhead of the TEKNA employs a dimensionally “live” box concept with 4 pairs of independently servo driven chains transporting 8 permanently mounted carriages. With this design we are able to change from a minimum pack width of 135mm all the way to 600mm without the need to change the “pitch” of the group, a process that requires operators or maintainers to climb on the machine and physically add or remove carriages from the overhead group.



▲ Turn-key solution, complete packaging line, designed and manufactured by Multipack.

Our new overhead integrates two more concepts together with the “live” box methodology. The second advance is to always maintain the fingers in the same vertical orientation instead of following a simple arc track with inverts the carriages during their return phase. By eliminating the need to accelerate the package for extraction from the overhead we gain advantages during folding and also reduce the speed of the final sealing which in turn allows lower sealing temperatures and improved Teflon belt life. The third advance is to make the group as short as possible and still encapsulate the full product range. The shorter group has allowed us to move the side tucking and folding downstream. Folding away from the overhead eliminates the need to add, remove or adjust the carriage-mounted fingers thus eliminating another part of the standard format change. The tucking and folding downstream from the overhead is a universal folding system. No parts are changed from minimum to maximum range of the machine. We have chosen this system over the popular horizontal blower folders as the advantages are well know; reduced compressed air consumption, higher quality folds on cube formats, no parts to change. The folding surfaces are hard anodized or nickel-teflon coated to maximize their service life.

Moving back upstream in the process from the folding we return to another critical process, the lower overlap sealing. This process has always been performed during the dwell in the movement of the overhead, a phase that at best might be 75° of a single machine rotation. This limit has required that the sealer must work at a very high temperature and with a very aggressive motion profile. The high temperatures are detrimental not only to the live of the sealer but also to the surrounding mechanical components. The needed motion profiles also stress the group and so more maintenance is required.

We have developed an alternative by integrating the lower sealer within the motion of the lower counterfolder so as to seal the package during the movement to the next position. This gives us a longer phase in which to seal the package thus reducing the needed temperature and also allows a softer motion profile. Wherever possible the adjustments for the format change have been motorized to reduce again improving the repeatability of the format change and reducing the incidence of human error or injury. We are pursuing equally innovative solutions for tissue roll and napkin package bundling and will have more to reveal in the near future. ●

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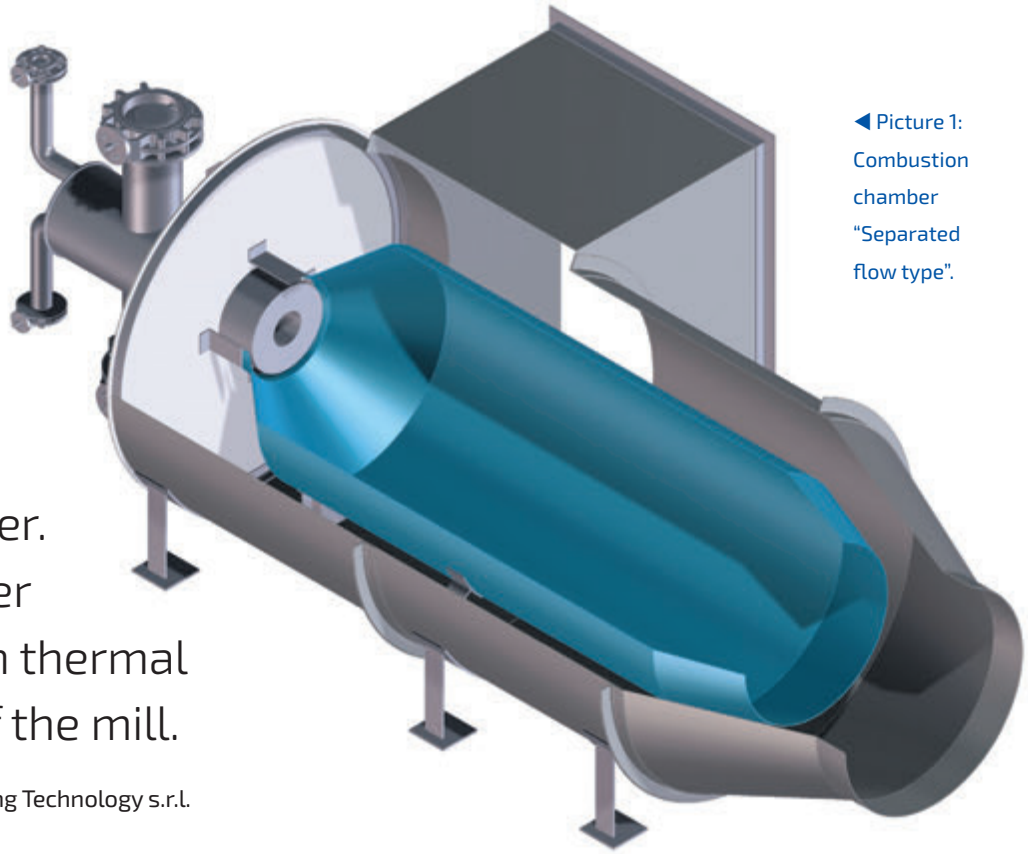
Doctoring the world

Novimpianti Combustion System upgrade for Tissue Mills



◀ Picture 1: Combustion chamber "Separated flow type".

Gas burners are commonly used to heat up process air used for direct drying of tissue paper. Burners are, together with boiler, the main thermal energy consumer of the mill.

by: Novimpianti Drying Technology s.r.l.

Yankee hoods installed in the past are very often equipped with burners designed to guarantee drying capacity and high reliability, but with no specific target about efficiency and emissions.
In the last few years, energy and environmental issues became important and drove great design changes. Now it is more correct to speak about "combustion systems" and not simply "burners".
A combustion system is made by: the burner itself; combustion chamber; control system (in particular the control of combustion air flow following variable .0). The design of the whole combustion system must guarantee the compliance with highly restrictive rules nowadays in force in Europe, North America, Australia. Furthermore, in addition to Country regulation, there are local rules that sometimes require special characteristics, mostly in terms of pollution emissions.
Novimpianti is frequently asked to update existing combustion systems, in order to improve thermal efficiency and respect all restrictions to the exhaust. In this case the first step must be an investigation, to understand the current equipment, fix all targets and help mill management to choose the best strategy. Of course there are many parameters to be considered, like:

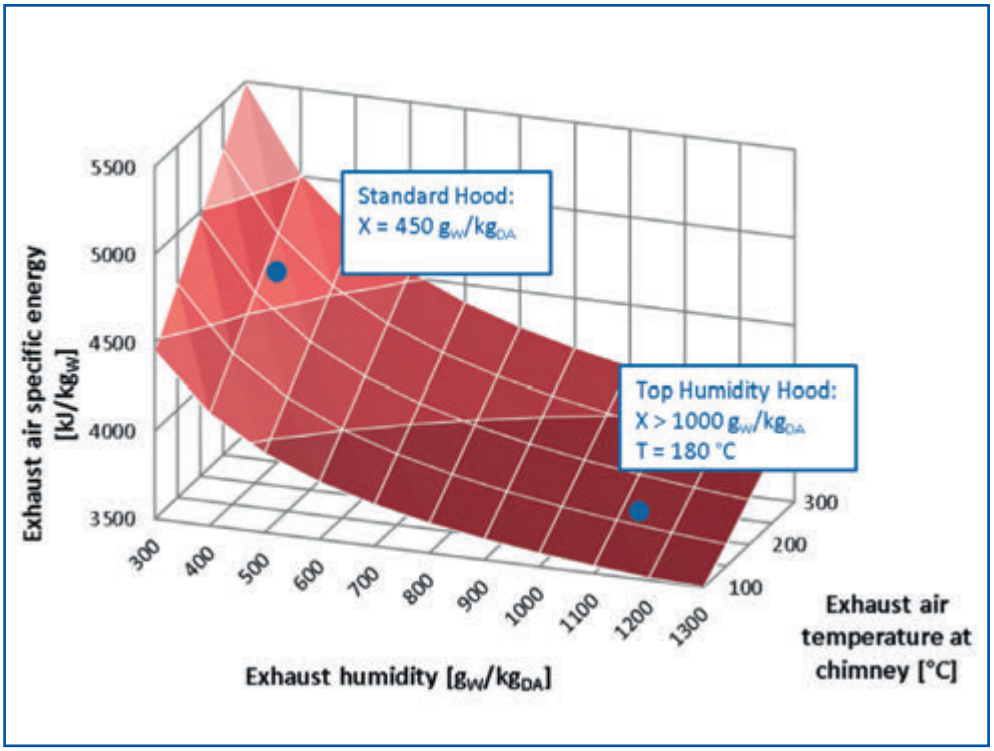
- Existing burners and combustion chambers characteristics;
- Maximum necessary power (avoiding useless oversizing);
- Available combustion air temperature (some burners can accept more than 300°C);
- Impact in air system layout;
- CO and NOx limits (e.g. 50mgCO /Nm^3 @17%O_2);
- Burner turndown (usually from 10:1 to 20:1);
- Combustion air-to-gas ratio control;
- In-line or corner burner;
- Process air injection into corner burner combustion chamber.

Combustion chamber - latest developments

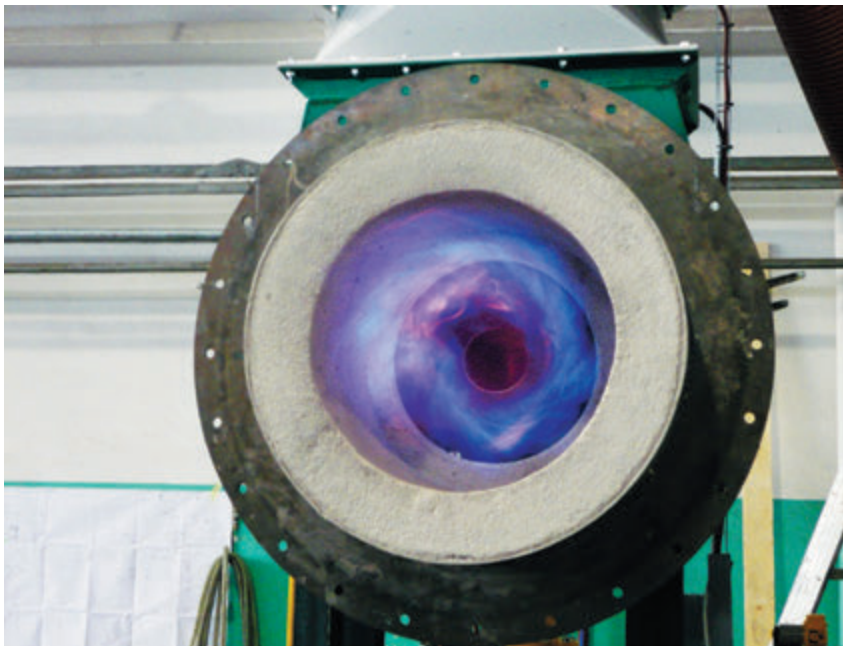
Combustion chamber geometry has been modified over time. Combustion chamber "Separated flow type" concept developed by Novimpianti features the flame pipe completely separated from process flow (***picture 1***). In this way we can protect the flame from cold process air, up to the complete oxidation of natural gas; furthermore, we completely avoid any risk of endplate overheating, with quick deterioration of burner and combustion chamber. In our last installations, the system is capable to inject a controlled process air flow into the flame pipe, reducing fresh air amount and optimizing CO and NOx emissions.

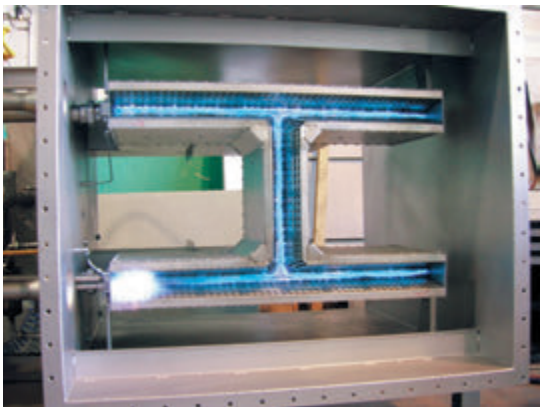
Air-to-gas ratio control for a significant gas saving

Air-to-gas ratio plays a key role in emissions control and thermal efficiency: high excess of air means lower flame temperature (i.e. high CO values) and limited humidity content in exhaust.
With high amount of fresh air the system cannot work at 0.8 - 1 kgw/kg_{DA}, values that can be reached in more stoichiometric conditions.
As commonly known, increasing from 0.4 kg_w/kg_{DA} to 0.8 kg_w/kg_{DA} means reducing exhaust dry air flow to 50%, with immediate gas saving as shown ***picture 2***.
There are a lot of installations, especially in Europe, with fix combustion air. This means combustion air flow isn't connected to burner output (like often happens in case of in-line burners). In other cases one actuator opens and closes both gas valve and combustion air valve, thanks to a rigid mechanical



▼ Picture 2: Benefit from exhaust humidity increase.





▲ Picture 4: In-line burner with fix comb. air.

◀ Picture 3: Corner burner with swirl flame.

▼ Picture 5: Example of combustion report page with CO value.

> Novimpianti is a primary supplier for the paper industry worldwide

connection. Now there are solutions with electronic connection between gas and combustion air dampers, managed by a safety PLC that takes care of the complete burner control system. It means that safety PLC is connected to all burner devices, from pressure switches to gas valves, from purge procedure to flame control. The result is an intrinsically safe and trouble free system.

Corner and in-line burners

Use in-line or corner type can have a big impact in system lay out. In ***picture 3*** a typical corner burner with its "swirl" flame and in ***picture 4*** a standard in-line burner with fix combustion air, very common in old installations.
Replacing an in-line burner with a corner one can be complicated, sometimes only possible with large-scale rebuilding in burner room, i.e. high cost and long machine shut down.
A smart alternative is replacing old in-line burners designed for fix combustion air with new in-line burners with modulating combustion air. This technology, directly coming from gas turbine postfiring application, has a good turndown with 20% excess of air only. It can be easily installed in the same combustion chamber, with a plug & play solution that cuts the costs of investment, installation and shut down. In terms of CO emissions, ***picture 5*** shows an example of achievable result.

Concrete results

Novimpianti numbers a few successful references in combustion system upgrade. What described above must be considered as guidelines, since for every mill it is necessary a dedicated preliminary study to choose a customized and profitable solution.
The solutions we propose aim at achieving thermal energy savings, reducing emissions to satisfy restrictions in force and maximizing the safety and reliability of combustion system to the updated state-of-the-art installations. All of these with attention to shorten erection and shut down time, for a cost effective modification. ●

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New and technologically very innovative machines for paper processing

United Converting (UC) was formed in 2004 when the founders of the business combined their extensive experience to start producing innovative machinery capable of responding to the latest market demands with the highest level of automation and flexibility.

by: United Converting S.r.l.

It would not be right to discuss the history of UC without mentioning the progenitor of all our current machines; the start-stop line mod S60 - the first and only fully electronic automatic start-stop line on the market. Our business presented to the converting market a start-stop machine with an unmatched speed of 600 m/min, an acceleration ramp time of less than 7 seconds which was capable of an average of +20% in terms of overall productivity whilst offering a power consumption reduction of 15-25% with its KERS systems versus any other product available on the market.

The advantages offered within the design of the S60 helped to create a strong and enduring relationship of trust between our business and our customers who, having experienced the cutting-edge technologies

◀ United Converting Headquarters, assembling floor view.

▼ Start-Stop electronic rewinder mod S60, front view.

we employ, have never looked back to more basic versions of the same machines offered by our competitors.
In 2008, 4 years after our start-up, the first prototype of our Automatic rewinder was created with the application of the UC patented airblade transfer system and also with the migration of all the technology used on the S60.
Today, our neXus series of fully automatic rewinders (for Consumer, Industrial and Hybrid applications) are built with an intensive focus on the use of the latest electronics technology and this design has evolved since its inception enabling us to offer a complete range of machines that can be made bespoke to our customer's

“New ideas are always in the air at United Converting”

▲ Fully automatic converting line for AFH products mod neXus I.

▶ Start-Stop electronic rewinder mod S60, Servo motor transmission view.

needs with operating speeds from 450 to 750m/min. The company’s interest in technical innovation has never ceased and our search for new challenges never rests. In 2012 a new system for automatic transfer on a folding machine was developed and patented whilst new ideas were considered for the folding section. Eventually in 2014 the first prototype of the Vista Interfolder, with a new and patented concept of frictionless vacuum application was born. In 2017 technical upgrades to our start-stop lines give us pleasure to introduce our latest rewinder, the S70, capable of 700 m/min maximum speed, improved acceleration/deceleration and transfer times. With the facility to easily integrate a double embossing station and lamination glue deck. Add to this the option for efficient coreless roll production and we believe the S70 can offer a solution to penetrate any point in the converting market. We recognize that remaining rigid and inflexible as a supplier operating within what is a very flexible and innovative market is the wrong approach. As such, we take great pride in our open-minded philosophy for catering to the individual requirements of each and every one of our customers. If the standard design of machine being offered is not quite right for the client, instead of expecting the products to be changed to suit the machine, we will work closely with the client to engineer bespoke solutions so that they can achieve exactly what they want. To enable this process to be executed correctly and efficiently, and indeed to support our clients all over the world through the lifetime of their machines, we have developed a comprehensive infrastructure of local offices across the globe - our head office is of course in Lucca, Italy but local offices can also be found in the UK, USA (two regional offices), China & Japan. New ideas are always in the air at UC; a completely new concept of fully automatic rewinder is currently under development with associated patents already applied for - stay in touch with us and watch this space for our next cutting edge development which is aimed squarely at the Consumer Market for producing low density, soft rolls at high converting speeds. ●

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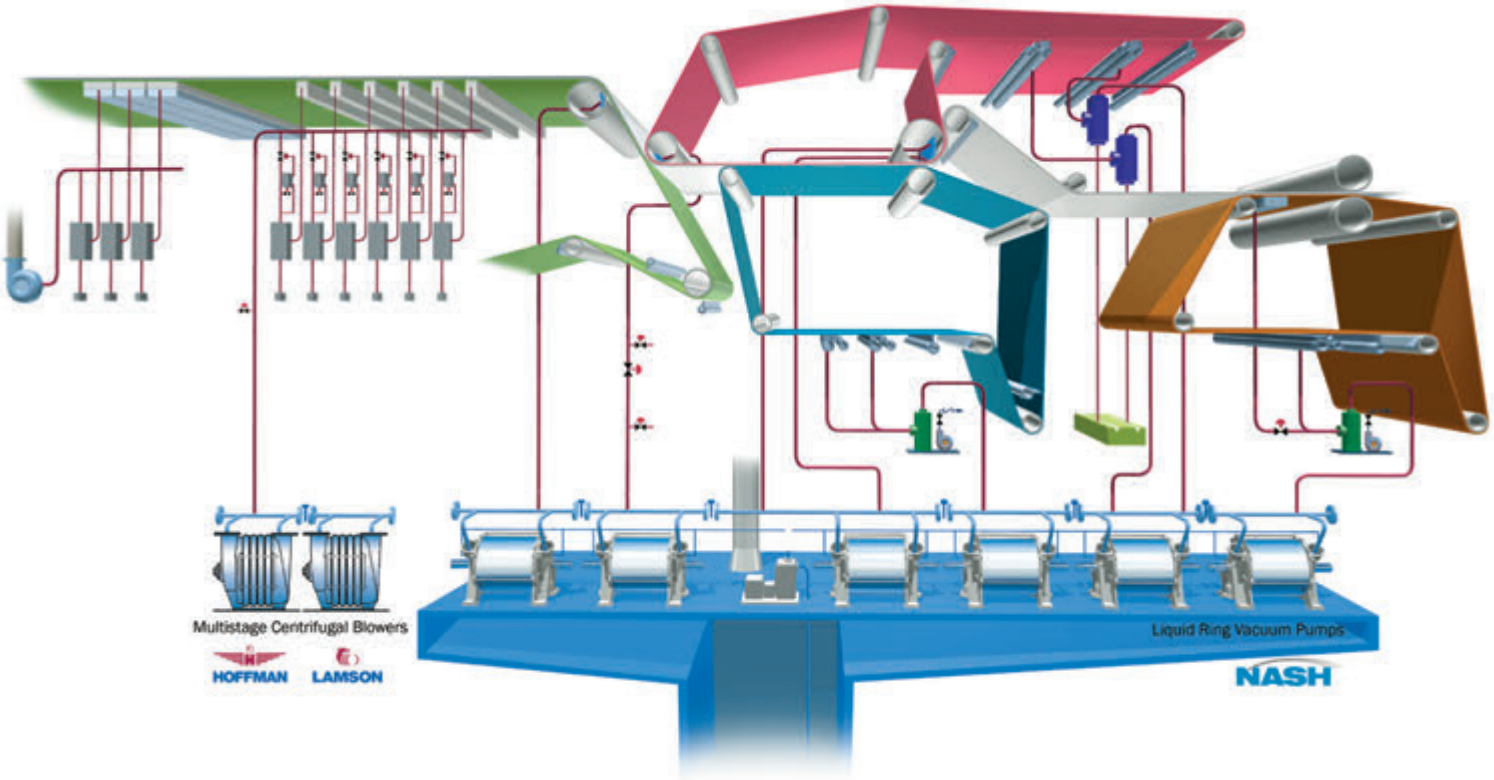
NASH
by Gardner Denver

Hybrid Vacuum Systems for Pulp & Paper Production

Combining liquid ring vacuum pumps with multistage centrifugal blowers for maximum efficiency.

by: Nash - Zweigniederlassung der Gardner Denver Deutschland GmbH



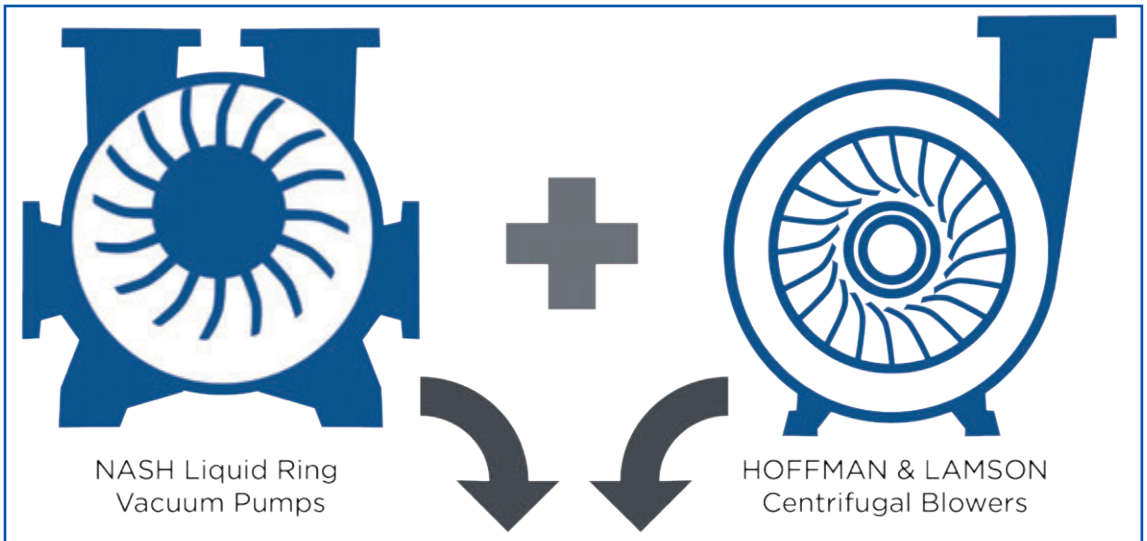
It should come as no surprise that the Paper Industry is making a continuous effort to reduce energy and utility consumption, both for economic and environmental benefits. Nash is well known for its de-watering vacuum systems for machines ranging from pulp to tissue. The ubiquitous NASH Liquid Ring Pump is recognized globally for reliable performance on this application. Drawbacks, however, include water usage and a perception of low efficiency. In response, Gardner Denver Nash has developed a unique hybrid vacuum system that combines NASH liquid ring pumps with Hoffman & Lamson multistage centrifugal blowers. The NASH hybrid vacuum system for paper production reduces power consumption by up to 30% while improving performance and system flexibility. Gardner Denver Nash manufactures both the liquid ring vacuum pumps and multistage centrifugal blowers used in this hybrid vacuum system. With over 110 years of engineering expertise, our global team combines the two technologies into one customized system solution that offers maximum performance and efficiency benefits. In this system, NASH liquid ring vacuum pumps are used on high vacuum services, including the couch, pickup, and felt conditioning. For maximum flexibility and efficiency, variable speed drives are incorporated into the system. This is especially important for machines that produce multiple paper grades. Hoffman & Lamson multistage centrifugal blowers, part of the Gardner Denver Nash Division's product line, serve the forming section vacuum duties. The multistage centrifugal blowers can more efficiently serve low vacuum requirements, reducing power and eliminating water consumption in this section. As an additional benefit, there is potential for heat recovery from the exhaust air of these blowers which could result in additional energy savings.

> "For almost 100 years Nash has supplied the paper industry with reliable vacuum pumps, compressors, and engineered systems"

In addition to efficiency improvements, the Nash paper hybrid vacuum system improves de-watering in the press section resulting in reduced steam loads in the dryer section. Other benefits include low noise levels, low maintenance costs, and improved reliability, and a full system warranty. The NASH Hybrid Vacuum System for paper production is a step forward in optimizing valuable resources while

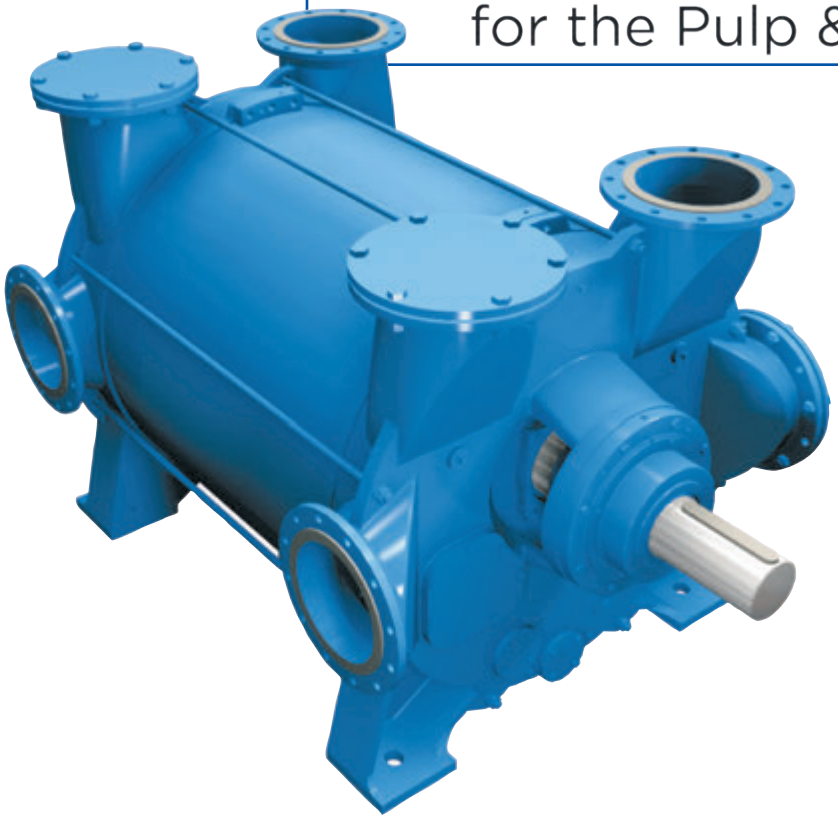
◀ Multistage centrifugal blower.

NASH
by Gardner Denver



NASH Hybrid Vacuum Systems
for the Pulp & Paper Industry

▼ Liquid ring vacuum pump.



Nash-Zweigniederlassung der Gardner Denver Deutschland GmbH
Katzwanger Str. 150 90461 Nürnberg - Germany
phone: +49 911 1454 7795 - **email:** nash.de@gardnerdenver.com
website: www.GDNash.com

maintaining a reliable and low maintenance paper machine vacuum system.

About Gardner Denver NASH

Founded in 1905 as Nash Engineering, Gardner Denver Nash was created in September 2004. Today, as Gardner Denver Nash, we provide improved global service and technical support for Nash liquid ring vacuum pumps, compressors and engineered systems, serving the chemical, petroleum, power, paper, mining, environmental, food, and wastewater treatment industries.

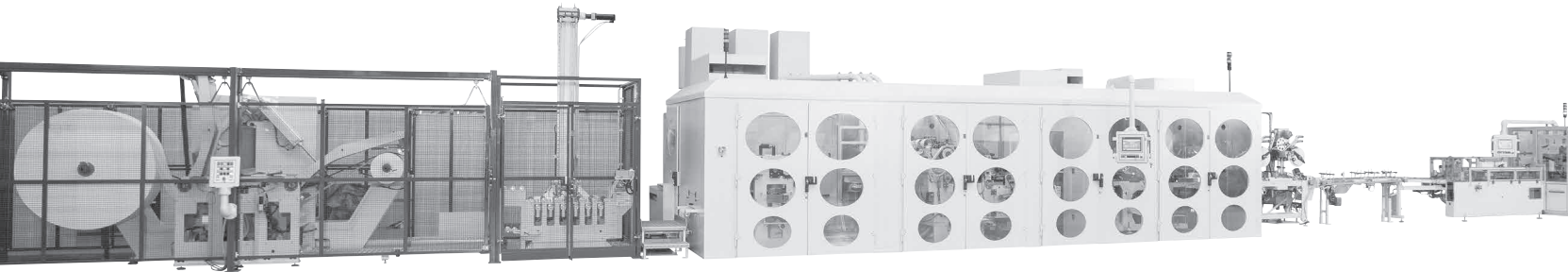
When it is apparent that dozens of solutions to the need for a vacuum system are potentially feasible, NASH engineers utilize their expertise to search out the best alternative. We investigate with our customers the economics of valuable product recovery. We take into account such environmental considerations as disposal of unwanted process carryover. We find ways to conserve power, water, and heat energy. We evaluate system arrangements, scheduled maintenance and service life.

We analyze available ratios of first cost to operating costs, so that our customers can tailor those different types of expenditures to their company's financial objectives. In summary what we do is to supply ENGINEERED SYSTEMS designed to solve customer problems. ●

850!

We proudly present our new complete Handkerchief Line from a single source, Made in Germany by SENNING!

- The Production Machine S.PM 820 + Bundling Machine 660 TG provides handkerchiefs at a high performance level and with the highest flexibility: The S.PM 820 can handle tissue of 2 to 4 plies and produces single packs with 5 to 15 tissues per pack – standard and compact – and bundles starting from 2 single packs up to 144 single packs. With maximum speed, the line can produce 8.000 tissues, 850 single packs and 100 bundles per minute. With this new Handkerchief Line, SENNING is setting a further state-of-the-art standard.
- Handkerchief Lines
  S.PM 820 + 660 TG with max. speed of 850 single ppm
  S.PM 805 + 662 TG with max. speed of 450 single ppm
- Wrapping Machines for facials, napkins, hand towels and non-wovens
  SE 660 with max. speed of 100 ppm
  SE 662 with max. speed of 60 ppm
- SENNING supplies machinery – Made in Germany since 1949 - for wrapping facials, napkins, hand towels and non-wovens, for single and multiple stacks.
- SENNING is able to design its machines individually according to your needs and requirements and to find customer-specific solutions.
- SENNING is the company to contact whenever you are looking for a reliable partner in connection with the production of handkerchiefs, facials tissues, napkins, hand towels and non-wovens.



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SENNING

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www.senning.de

A GLOBAL APPROACH TO TISSUE PRODUCTION

Products-Expertise-Application-Dosing Equipment

In the last 20 years, the world of tissue paper made great strides. The market is growing worldwide and it is developing with continuous innovations. The production of tissue paper is the last frontier of technologies for machinery, equipment and chemicals.

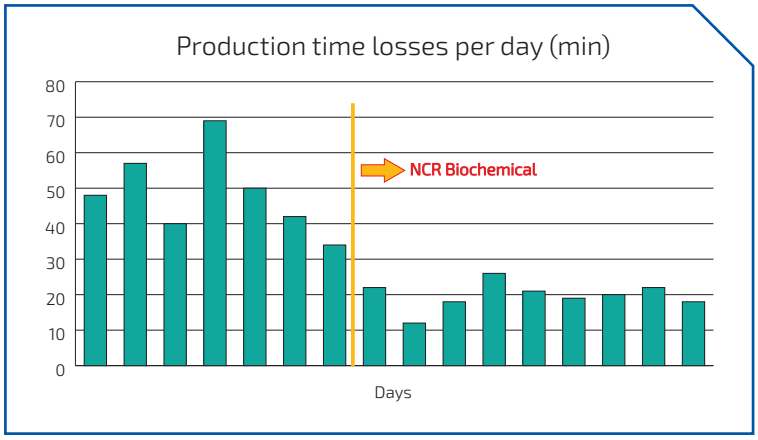
by: N.C.R. Biochemical S.p.A.

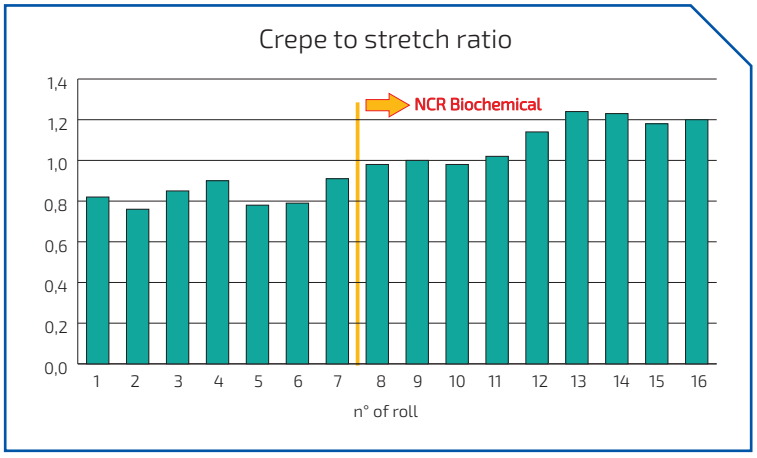
We, at NCR Biochemical, are specialized in the production of tissue-making additives that match the latest mechanical innovations. We dedicated the last 15 years to develop technologies that allowed our customers to obtain high performances at convenient costs and lowest possible production losses. Thanks to a wide team of chemists, microbiologists, paper makers and engineers, we have developed an holistic and global method to help tissue producers increase their performances. NCR team studies every element of the cycle and finds out the best solutions combining four key factors: latest chemical technology, knowledge of

Tissue machine.

our experts, in-depth know-how of the applications, innovative dosing equipment. The final and unique goal is to drive customers to success.
Many chemicals have relevant impact on the final result of tissue production, and all of them must give benefits and Return on Investments to the mill. The package of treatments we supply include: Yankee Cylinder adhesive, release, coating modifier and protective technologies; Softeners, without debonding effect; Defoamers and Deaerators; Biocides and Antislime; Surface conditioning and cleaning additives; Antiscale, Antipitches and Antistickies, Dry strength, Temporary Wet Strength, etc. The Yankee cylinder is the heart of tissue-making and the creping process is the fine art of papermakers. The application of chemicals on its surface gives quality to the paper and runnability to the machine. NCR Biochemical drove the development of a large range of Yankee Cylinder additives, which represents its greatest success. We earned the trust of our customers and


Coating equipment.

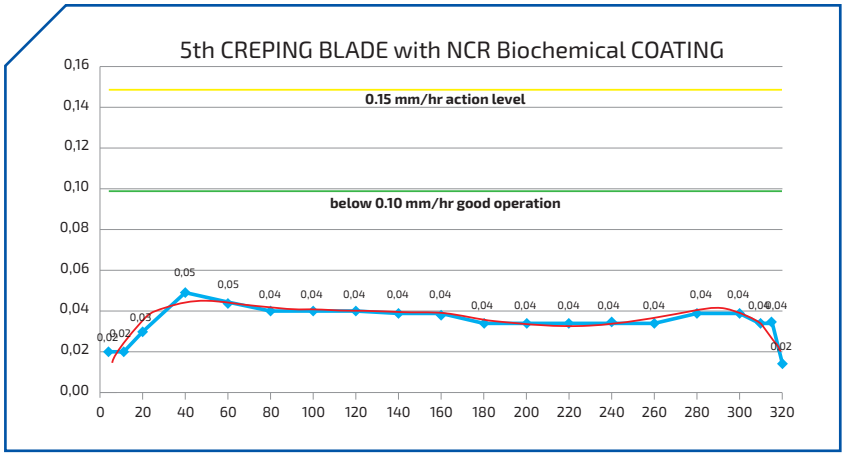




we are supplying over 80 of the fastest and most performing Tissue machines, mostly located in Europe, Middle East, Russia and China. What can paper makers obtain through a dedicated and specific approach to the Yankee treatment? The most important achievable results are the quality of paper produced, reduction of costs and gain profit. Our target is to optimize the following parameters:

- increase runnability and treatment flexibility of all the operational conditions;
- decrease the daily loss of production;
- improve stability after blade changes or hood opening;
- lower the difference between crepe ratio and paper stretch and, whenever possible, increase elongations;
- eliminate film thickening at the edges;
- stabilize coating, even in case of extremely wet or dry profiles;
- give excellent protection to the Cylinder surface and doctor blades;
- produce softer Tissue paper;
- increase the quality of produced paper;
- reduce or eliminate pin holes on low and very low weight paper sheets;
- strongly reduce vibrations and, consequently, reduce or eliminate chatter marks phenomena;
- highly uniform the drying profile and Q data on all the sheet width.

These results can be achieved by using a dedicated group of products, designed for each machine, and considering all the elements involved: mix of used fibers, machine speed, other additives used in the process, YD heat exchange, YD surface characteristics, moisture profiles, blade holder, blade composition, angle of doctoring, blade stick-out, etc. The best results cannot be achieved just by using chemicals. The appropriate dosing equipment gives perfection to the application. NCR engineers focus on producing extremely simple and efficient dosing stations for our chemicals. These stations are reliable for a long time and can bear critical conditions (wet and dusty environment) that are often present in Tissue mills production.
The study of the whole cycle is crucial to understand and decide the right combination of chemical, application and equipment.
Only through a wide point of view and a global approach, we can solve any problem. Our specialized team will always manage the problems of Tissue mills like their own ones. Our passion for tissue paper brings us close to our customers and makes them satisfied and enthusiastic. ●



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Second Hand Machines.

A Matter of Trust

▲ A PCMC toilet/kitchen roll rewinder line supplied in 2016.

A considerable percentage of used converting equipment changing hands in the tissue industry is sold by second hand machinery dealers such as TISSUE TEC Sales & Service GmbH.

by: TissueMAG

There are many reasons in favour of taking advantage of a specialized dealer, however, one thing can be considered to be the most important factor for both the seller and the buyer of used equipment: the trust they have to give towards the dealer! There are many kinds of dealers in the market, however, few are specialized and focus on the comparatively small tissue industry only.
The majority of dealers cover a wide range of machines and applications which go beyond tissue converting machines. It appears, that they might have access to a greater number of customers and potential buyers, but you have to bear in mind that these customers are also active in divergent markets.
Moreover, they may also lack the knowledge about the rather specialized converting equipment that can be found in the tissue industry, and its players. Therefore, both the seller and the buyer have to trust the dealer with regard to knowledge, reliability, confidentiality, market coverage and networking.

Motives for Sellers and Buyers

At first glance it seems, that the owner of surplus equipment is pursuing a different goal than the potential buyer of this equipment. Obviously, it will be his aim to achieve the highest price possible for his equipment, while the potential buyer's priority is to acquire it for the lowest amount possible. The seller's second motive is to dispose equipment that is no longer required for many reasons.
The motives of potential buyers to search the market for used equipment can be manifold. The most obvious reason is the financial aspect, as a good number of converters simply cannot afford to acquire new equipment. The second reason is time, as usually used equipment is immediately available. The third reason, which applies quite often, is that with a used machine a converter can test the market

▲ A complete MTC handtowel line supplied in 2017.

acceptance of a new product without a significant investment in a new line. However, their common goal is to do business based on the equipment available on the second hand machinery market, so one of the primary tasks of TISSUE TEC Sales & Service GmbH is to preserve the interests of both parties and to handle their projects accordingly.

The Job of a Dealer

Acting to the benefits of both the seller and the buyer requires knowledge about the technical configuration of the equipment, the products that can be manufactured on it, but also the future availability of spare parts, the potential extensions/modernisations and, last but not least, about the marketing possibilities and the obtainable price. The seller needs to trust the dealer for a

realistic appraisal of the equipment's value, its marketing prospects, and also that the dealer respects certain sales restriction that may apply. The potential buyer, on the other hand, needs to trust the dealer that he is sincere about the equipment, in particular with regard to the scope of supply, the products it produces, and its condition.

Behind the scenes, for a dealer there is a lot more to consider, prepare and actually do than both the seller, and the buyer normally recognize. In addition to the above mentioned skills and knowledge, TISSUE TEC Sales & Service GmbH is also providing the full range of service such as machine relocation, refurbishments or intermediate storage. In the past, TISSUE TEC Sales & Service GmbH has successfully realised the sales and relocation of numerous converting machines, sometimes under difficult circumstances, e.g. by taking out two complete pocket handkerchief lines out of the 4th floor of a high-rise building in Hong Kong. Due to 30 years of experience in the tissue industry, the key people of TISSUE TEC Sales & Service GmbH exactly know their customer's demands; they are capable to satisfy the needs and expectations of both sellers and buyers of used equipment.

A complete GAMBINI toilet/kitchen roll rewinder supplied in 2016.

▲ Take-out and delivery of a W+D/SENNING pocket handkerchief line (located in the 4th floor of a high-rise building) in 2017.

> "One of the most trusted dealers in the tissue industry is TISSUE TEC Sales & Service GmbH"

Their knowledge covers toilet and kitchen roll rewinders, industrial roll rewinders, napkin and pocket handkerchief machines, handtowel and facial tissue folder, coaster machines etc.

For any request regarding used tissue converting equipment, TISSUE TEC Sales & Service GmbH is a reliable partner in the tissue industry. Second hand machines - a matter of trust which can be relied upon to achieve the best conclusion for both the seller and the buyer! ●

TISSUE TEC Sales & Service GmbH
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phone: +49 2133 9771616 - **email:** wolfgang.tillmann@tissue-tec.de
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mobile: +49 172 6817338

Providing key solutions for the tissue industry

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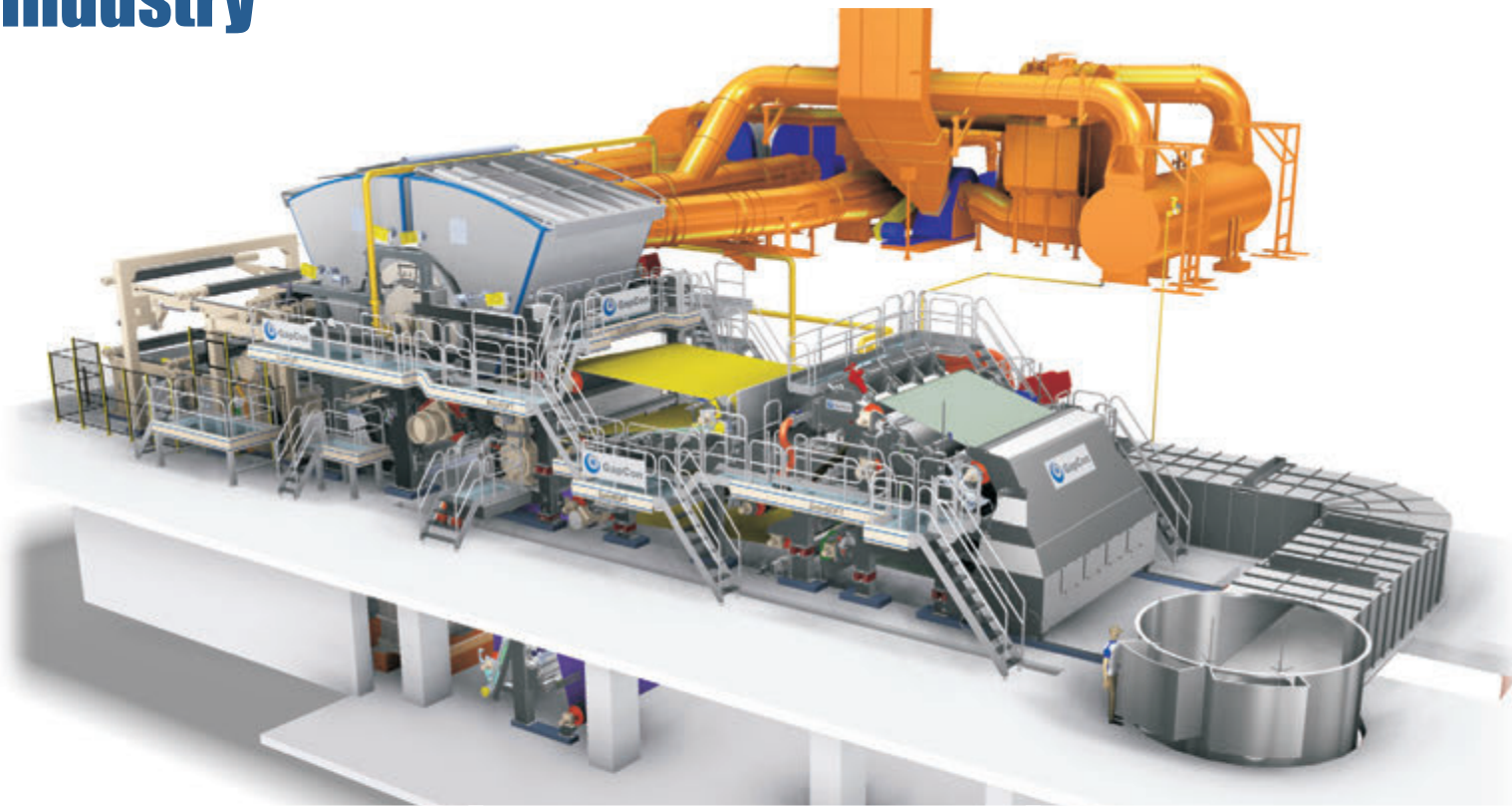

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Integrated


Sonoco Alcore's Intellicore, a core equipped with RFID tag.

Sonoco Alcore has been setting the global standard of tube and core solutions for over a decade. With a complete line of quality products and services perfectly tailored to the precise needs of its customers across the supply chain, Sonoco Alcore's integrated facilities support its ambitious plans for development.

by: TissueMAG

SONOCO ALCORE®

to the core

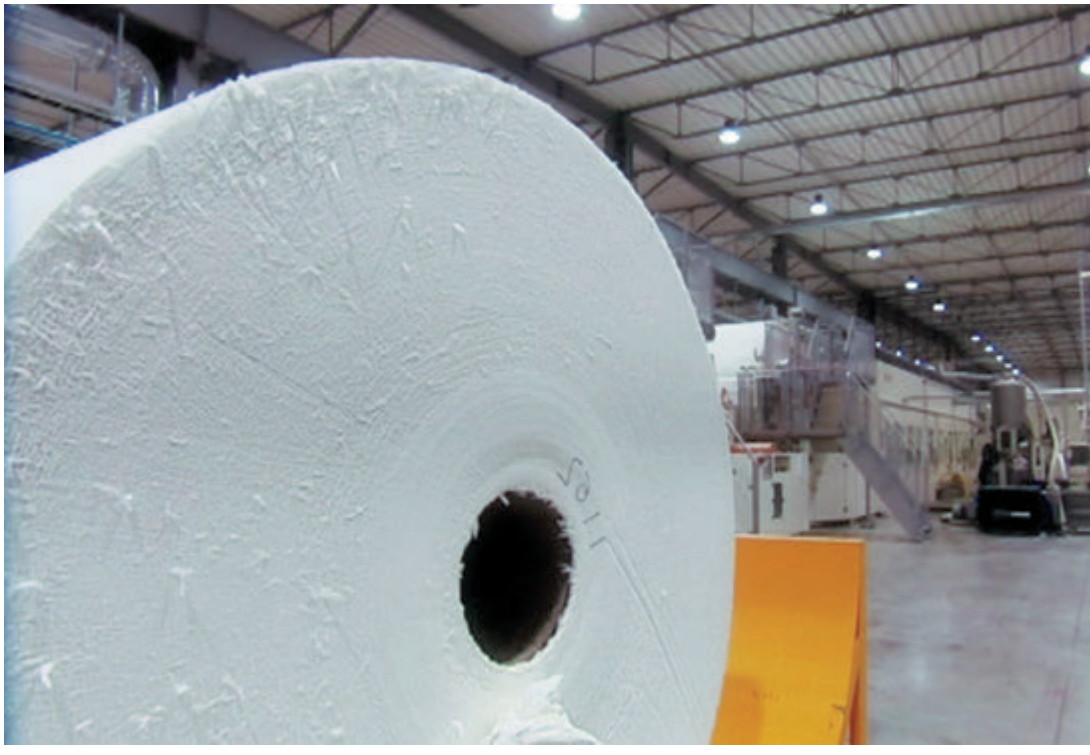
Global giant Sonoco enjoys annual sales of USD 5 billion and employs over 21,000 people worldwide. Well-known and respected for its global consumer packaging, industrial products, protective packaging and supply chain services, Sonoco has more than 330 operations in 34 countries. Part of the Sonoco family, Sonoco Alcore is the primarily-European tube and core solutions division, with its products including film cores, tape and label cores, textile cores, mill cores and plugs. The tissue cores from Sonoco Alcore offer consistent quality, unique features and technological advances that combine to meet its customers' specific needs in the core applications of the towel, tissue and hygiene paper industries.

TissueMAG spoke to **Emilio Caracciolo**, area sales director for Sonoco Alcore in Italy, where three state-of-the-art facilities are located, to learn more about how the company is developing and manufacturing ever-more advanced cores for the tissue sector. Mr Caracciolo said: "Sonoco Alcore is the leading provider of total converting solutions for customers around across Europe, with experts available all over the world, ready to work with our customers to design the best product for their specific requirements. Here in Italy, we have three incredible production plants for cores, one in the north, one in the north east and one in the south, that gives us complete coverage of this exciting and demanding sector."

Right from the mill

As a proudly integrated converter, Sonoco Alcore in Italy also has its own paper mill. Mr Caracciolo continued: "We produce our own raw materials in accordance with our precise needs at our own mill near our plant in the north of Italy. This gives us a great advantage as we develop our products in partnership with the mill. We do not have to buy in raw materials, rather we make exactly what we need. As we have vast experience in producing reusable tissue cores, by working with our own mill to manufacture the raw materials, we can ensure that we have the specific board for the multi-way

▼ Tissue paper rolled on Core.



> "Sonoco has more than 330 operations in 34 countries"

reusable cores we offer to the tissue industry." The multi-way reusable cores are certainly an important feature in the Sonoco Alcore portfolio. Customer-specific features include the ability to use special outside ply and deliver a perforated core to ensure individual customer needs are met. The cores can be reused more than 25 times from paper mill to converting department, having been loaded and used as required, thus cutting the overall costs involved in the process.
Mr Caracciolo noted: "Being completely integrated affords us this; our cores are so reliable. An additional benefit is a reduction in scrap during the handling process to ensure high productivity and decrease waste to our customers."

▲ Tissue paper rolled on core in storage room.

Integrated intelligence

The advantages of the Sonoco Alcore cores for the tissue sector go beyond the performance of the core itself.
With ever-increasing options to integrate technology into the cores, the company is able to offer various tracking, identification and location options.
Mr Caracciolo said: "Our Intellicore roll tracking system uses the world's first radio frequency identification (RFID) enabled cores. This allows customers to track both the core and also the finished roll, following the information and the product. It's very much an evolution of our experience in RFID technology as it lets customers see where the product is, which type of product is being used and how many times the core is used. This valuable information supports our long product life cycle promise."

> "The tissue cores from Sonoco Alcore offer consistent quality, unique features and technological advances"

Sonoco Alcore's RFID-based Vendor Managed Inventory (VMI) allows Sonoco to offer paper core VMI as an automated service to end customers.
As part of the manufacturing process, the cores are equipped with RFID tags and registered in the VMI system, so real-time information is configured, such as warehouse levels, delivery times and alarm levels.
Mr Caracciolo added, "Our interesting VMI can work together with Intellicore; it's essentially one step beyond Intellicore as it further optimises our customers' supply chain processes through highly efficient, effective inventory. Customers can track and see all the relevant information for their tissue cores, so the core is truly an integral part of their production."

Optimising investment

With the non-stop, completely integrated converting from Sonoco Alcore already highly proven in the growing field of tissue cores, Mr Caracciolo is understandably excited about its plans for the future. He concluded: "Cores are very important to our customers. Without them, they cannot work. At Sonoco Alcore we propose reliable cores that improve runability thanks to a decrease in vibration allowing the core to handle the fastest winding speed. For example, our SR-350 reusable core for jumbo rolls has been created after specific research that understood the requirements of the most important tissue paper manufacturers. Our goal is to optimise our customers' investment in their machinery by ensuring that their cores are as advanced as their equipment. All too often in the tissue sector manufacturers will have the latest machinery but not the most effective cores; the best way to maximise investment in equipment is to use Sonoco Alcore's portfolio of smart cores, which have been developed and manufactured alongside the customer at our wonderful integrated facilities here in Italy." ●

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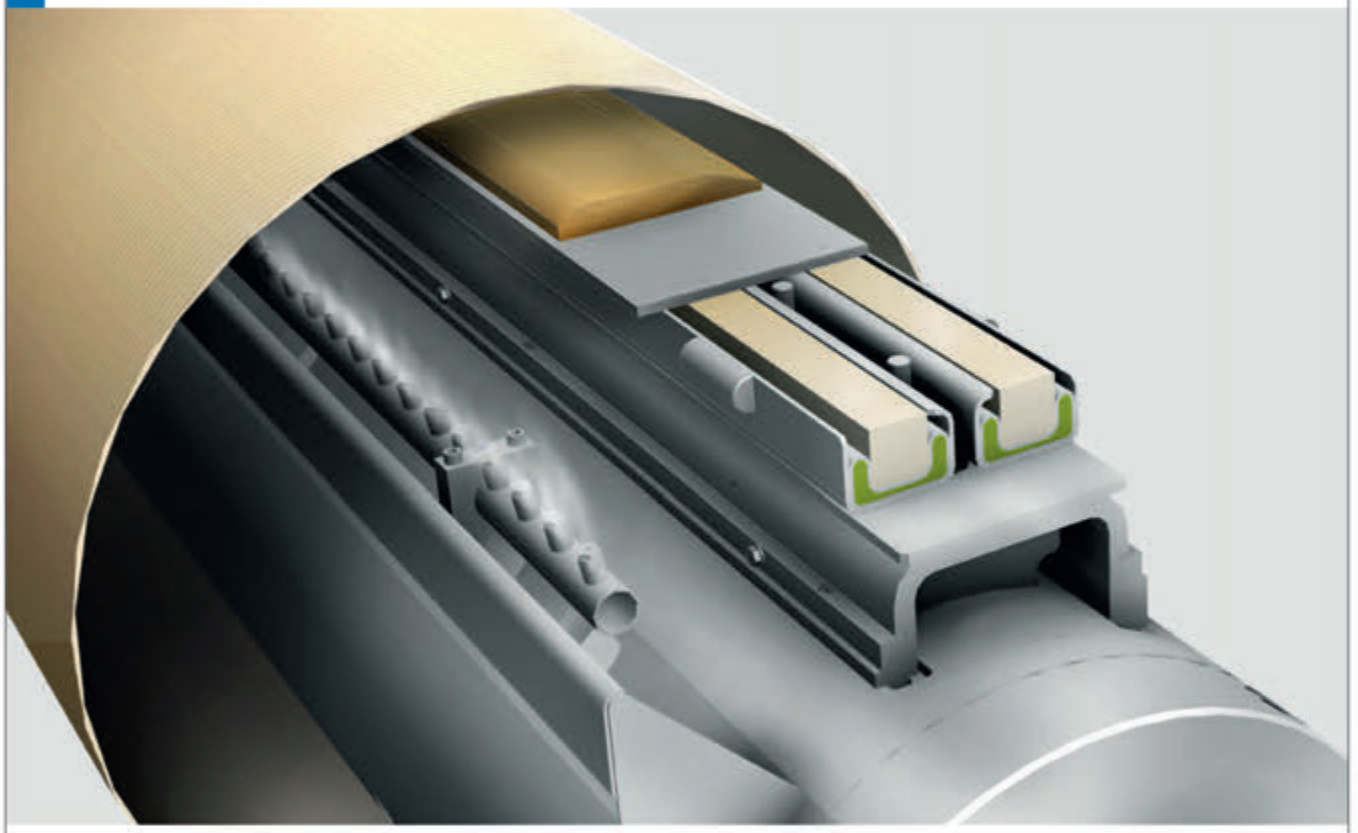
ANDRITZ
Pulp & Paper

*Prime*Press XT Evo

The newest evolution in shoe presses

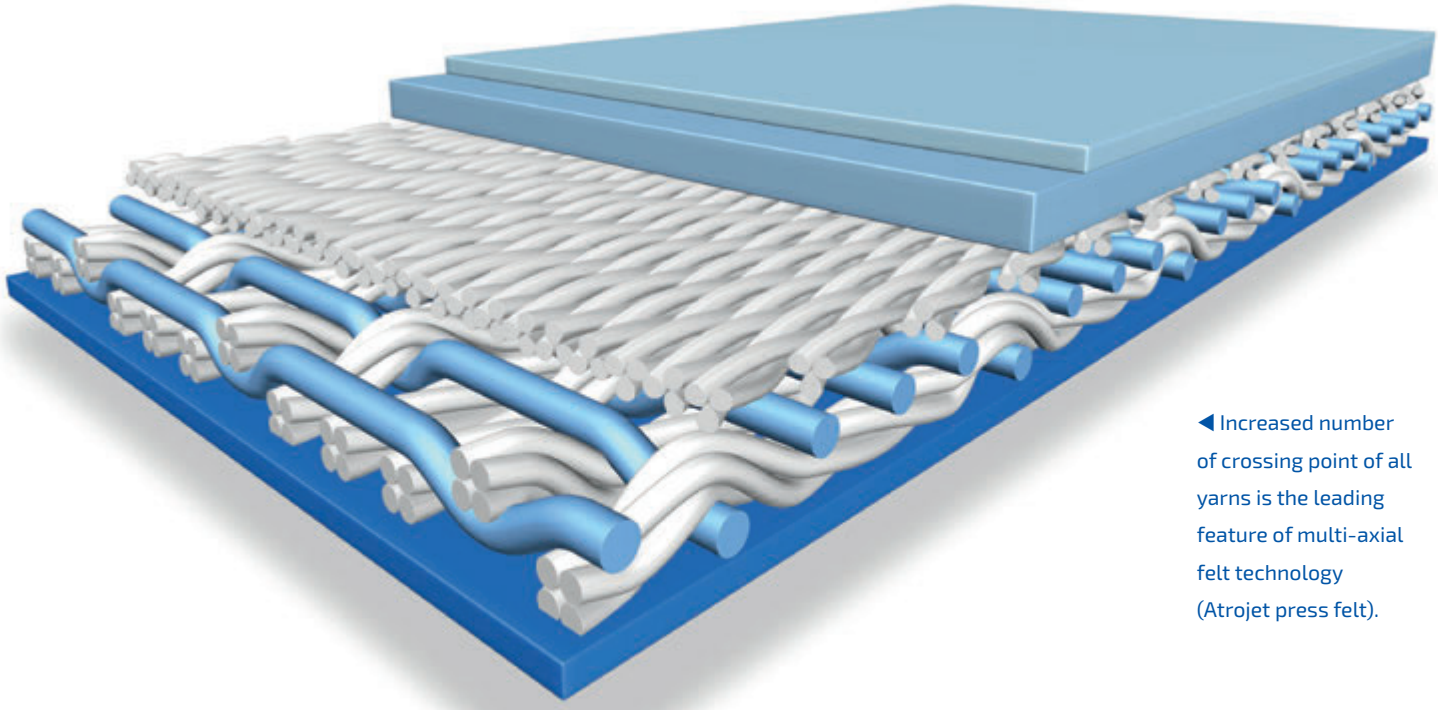


The *Prime*Press XT Evo is the latest development in shoe press technology, boosting drying efficiency and tissue production. The new ANDRITZ shoe press gently dewaters the web, but still achieves a far higher post-press dryness than conventional presses. Due to the new energy-efficient press design, improved dewatering and reduced need for thermal drying, the *Prime*Press XT Evo achieves significant savings in energy.

Alternatively, a noticeable increase in capacity can be achieved. For further information, please contact: tissue@andritz.com

www.andritz.com

We accept the challenge!



◀ Increased number of crossing point of all yarns is the leading feature of multi-axial felt technology (Atrojet press felt).

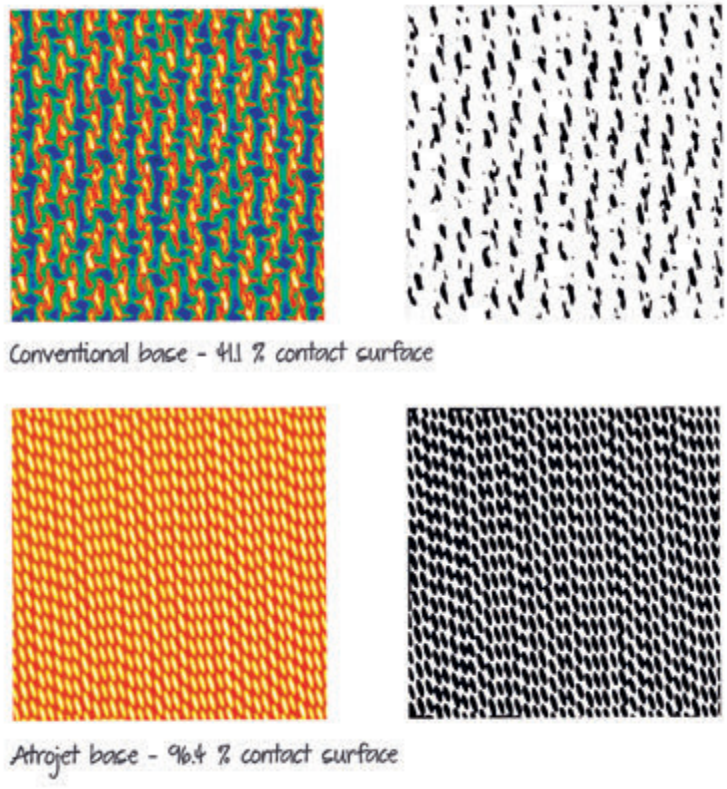
Heading for new shores **with Atrojet from Heimbach**

In 2011 a new R&D project was launched at Heimbach to unite the advantages of their most significant press felt design groups, the non-woven design group Atrocross and the multi-axial design group Atromaxx who both belong to the modern felt designs, so called advanced technology bases (ATB).

by: TissueMAG

Non-woven Atrocross and multi-axial Atromaxx press felts are offering comprehensive product ranges in their individual design group to meet the requirements of press felt application.
Either design group have their prominent advantages such as short break in time and high nip dewatering capacity of Atrocross or the great flexibility of base weave combinations of Atromaxx to meet individual and particular requirements which is important for customized well-engineered press felt application.
In addition to these two modern press felt design groups the classically woven, respectively laminated base weave felt designs, belong to the Heimbach assortment too.
Even though the existing product spectrum of Heimbach is very sophisticated, Heimbach keeps on improving its existing product lines and developing new products for the market.
Atrojet is the brand name of one of Heimbach latest developments which is an innovating new press felt design combining the advantages of multi-axial and non-woven technology.
With the multi-axial non-woven technology the Heimbach felt designers can meet the particular requirements of press felt positions even better. The specific quality of Atrojet is the structure of the base inside. With Atrojet the inside base facing the paper side consists of a unique non-woven layer. That layer of yarns is made of machine direction yarns only which results in great strength, evenness and smoothness of the base facing the paper side.
The machine direction (MD) yarn structure is arranged in diagonal direction which is the characteristic multi-axial angle improving collapse resistance by increasing crossing points of all yarns.
Broad flexibility is given by the fact that the non-woven paper side layer can consist of different ply twist yarns as well as different yarn diameters and flexible yarn count.
The evenness and uniformity from inside the felt provides smooth felt surfaces through high contact area. The homogeneous and high contact area of Atrojet press felt base is superior among press felt technologies.
Homogeneous compact felts are important features for Tissue felt application regarding even pressure transmission at the press nip which is key for even dewatering and even CD profiles of the paper.
The roll side base of Atrojet felts is made of multi-axial arranged components and are selected as per individual request concerning void volume, mechanical strength etc. and in context of the individual requirements of the position e.g. one or two nip positions or shoe press position, uhle boxes & vacuum rolls involved.
A typical Tissue machine could present the performance of a press felt in the proper light. Mileage of >100.000 km while passing about 6 Million nip cycles and handling >50.000m³ of water are normal requirements for a Tissue felt. In addition, the level of performance is expected to be at steady high level all along the service life of a felt. Modern press felt designs from Heimbach are high-tech products which meet these requirements.
In case that process parameters vary very little the felt design can be fine-tuned to its maximum

> “Innovating new press felt design combining the advantages of multi-axial and non-woven technology”



▲ With its uniform machine direction yarn structure Atrojet has far greater surface contact than conventional bases. This leads to more even pressure transmission at the press nip resulting in very steady dewatering and even CD profiles.

◀ Franz Kiefer (left) and Jochen Pirig, Strategic Product Managers at Heimbach.

atrojet.T

▲ Especially designed for the production of tissue papers.

> “Atrojet represents the next evolutionary step in felts sector”

performance under those standard conditions.
As more the process parameters do vary as more challenging can be the designing to get an adaptable felt design.Typical example of varying process parameters are paper grade changes which include machine speed and paper weight changes but also affect usage of different furnish compositions like virgin pulp or recycled fibres as well as usage of wet strength resin or dye and fixative.
Production planning is always aiming for as smooth as possible transition of process parameters during machine clothing lifetime.
But these days flexibility can be key too, just to think of just-in-time deliveries, so sudden process changes may do occur. These changing conditions the press felt has to tolerate.
Here the Atrojet design flexibility can offer advantages to adapt to those changing conditions well.
Thanks to the homogeneous and strong inner structure, which also contributes to high fibre batt anchorage, Atrojet has proven its robustness towards harsh high pressure shower cleaning which can prevent felt clogging e.g. when changing from virgin pulp to DIP and/or producing non wet strength to wet strength grades.
Atrojet has been proven itself in the field to be able to take up even long-term laminar HP shower at pressure in range of >30 bar.
Heimbach has invested a seven-digit sum in its **new Atrojet** manufacturing facility. Atrojet production is in full swing since first quarter 2016.
Atrojet represents the next **evolutionary step in felts sector**. Heimbach press felt product line-up has increased its market-orientated approach through Atrojet again. ●

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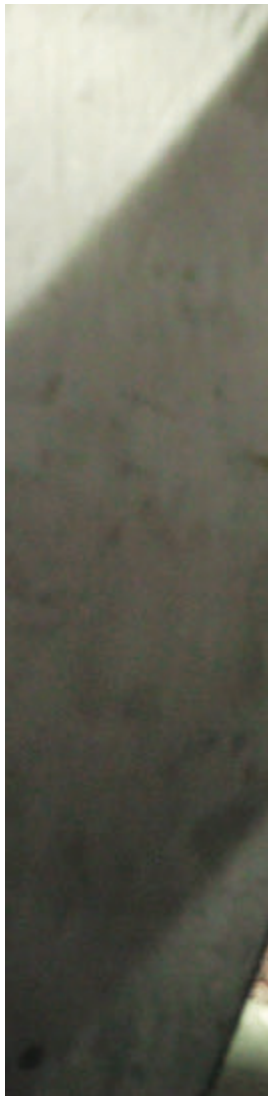
Tissue converting equipment

Operational cost reduction in a paper mill



Fit-for-purpose vacuum system and efficient doctoring and dewatering solutions for forming and drying sections are the fundamental base for the good energy efficiency and low cost pulp, paper, board and tissue production.

by: Jukka Lehto - CEO & Managing Director, Runtech Systems Oy
Jussi Lahtinen - Sales Director, Runtech Systems Oy
Patrik Högl - Technical Sales Manager, Runtech Systems Oy

Runtech Systems Ltd. is a Finnish, privately held, company that develops, designs and supplies equipment to the paper, tissue and pulp mills. Hundreds of paper, tissue, board and pulp mills benefit from our dewatering meters, vacuum systems, tail threading equipment and doctoring solutions. Years of hands-on paper-making know-how differentiates Runtech from traditional hardware suppliers. Our customers benefit from integrated solutions that result in significant operational cost savings, improved machine runnability and product quality.

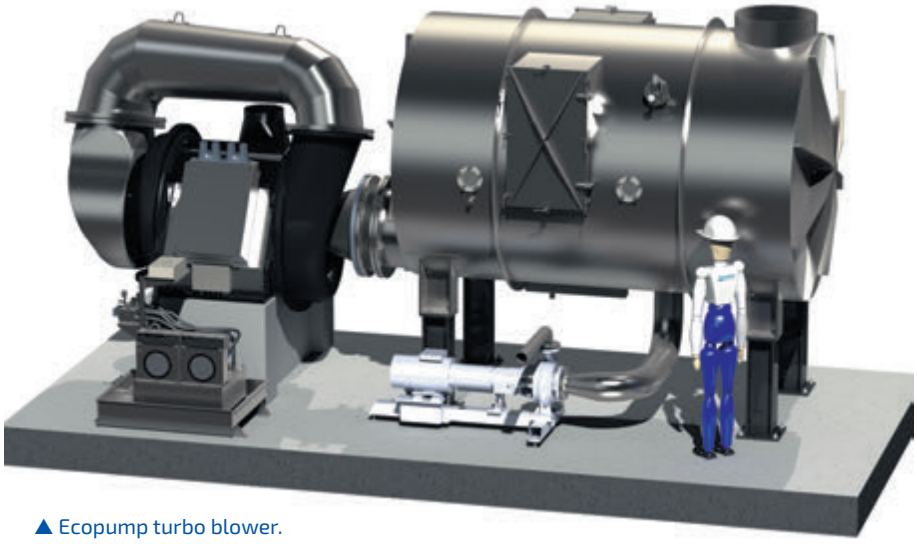
Vacuum at a paper machine

Vacuum at a paper machine is used for a variety of reasons. Dewatering the paper sheet is the obvious, holding and controlling the route the sheet takes through the press section and conditioning the press felts are other key uses of vacuum in a paper machine. Vacuum is also used to hold and control the water jet at a suction roll.

Early paper machine designs did not use vacuum at all, but relied on gravity and press nips to dewater paper. This we refer to as nip-dewatering. Machine speeds were then much slower than what we today are accustomed to. Today it is hard to imagine a paper machine without a vacuum system, and felt-dewatering is today still the most common way to dewater the paper in a press section.

The vacuum levels at a paper machine are typically between 5 and 70 kPa, which is relatively low compared to other vacuum applications in, for instance, the chemical industry. The air flows, though, are very high due to the large open areas we see in a paper machine.

Vacuum, which is a result of air being pulled through a restriction, is an expensive tool; it is one of the top three energy consumers in a paper mill. Historically it has been made available



▲ Ecopump turbo blower.

in abundance, and often used in excess. Today we face increasing cost of energy. Paper mills are demanding reduced operational costs to stay competitive. Therefore, it makes sense to review air flow demands and, when suitable, apply old school thinking, i.e. nip-dewatering rather than felt dewatering.

Ecoflow™

The primary function of a wire- and press section in a paper machine is to remove water from the paper sheet. In order to understand the effectiveness of individual elements (such as save-all pans and suction boxes) of a wire- and press section,

dewatering rate must be measured. Without this, critical air flow (i.e. vacuum level) review and consequent optimization cannot be successfully carried out. Water that is removed from the paper sheet contains air, and is often subject to foaming. Traditional magnetic liquid flow meters demand a homogenous flow and will not be able to provide accurate data. Ecoflow™ meters are designed to measure water flow across a mechanical restriction and are not sensitive to entrained air or foaming. These devices are used both under vacuum (in a separator drop leg) and in atmospheric conditions.

Doctoring

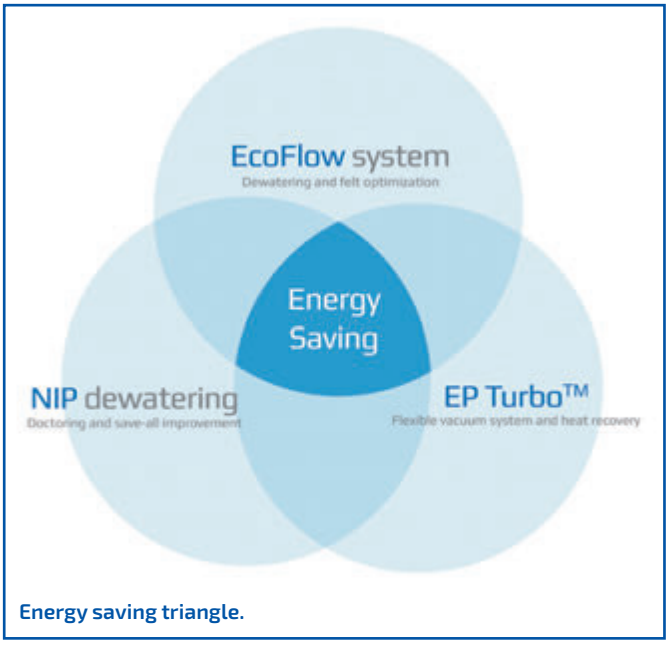
The most economical method of water removal in a press section is nip dewatering, as opposed to felt dewatering which requires energy demanding air flow. Nip dewatering is facilitated by allowing felts to run wet in combination with suitable doctoring and save-all equipment. Suction rolls are often equipped with double doctors to prevent re-wetting and maximize void volume to allow best water removal. Save-all pans should be designed to manage the water that is removed from the nips, and engineered to be rigid enough to accommodate doctor holders.

▼ Ecoflow.

Ipek Kagit, Turkey

Ipek Kagit is a Turkish tissue paper producer. Runtech replaced the existing vacuum system (3 liquid ring pumps) of TM3 with a single Ecopump turbo blower in 2015. An EcoFlow™ system was installed at the same time allowing the mill to optimize the vacuum levels without sacrificing dewatering efficiency. The result was 50% savings in energy and significant reduction in water consumption.

Dewatering and doctoring are not only related to energy consumption, but also plays a big role in paper machine runnability, efficiency and profitability, as well as paper profiles. Therefore, a well designed and operated dewatering and doctoring system is the key to a well performing and energy efficient press section. Runtech is one of the leading suppliers for the improved dewatering and doctoring solutions for the all kinds of pulp, paper, board and tissue machines. In many cases, Runtech's solutions lead to a 1-3% increase in dryness after press section which saves considerable amount of energy in the dryer section (4-12% less steam).



Energy saving triangle.

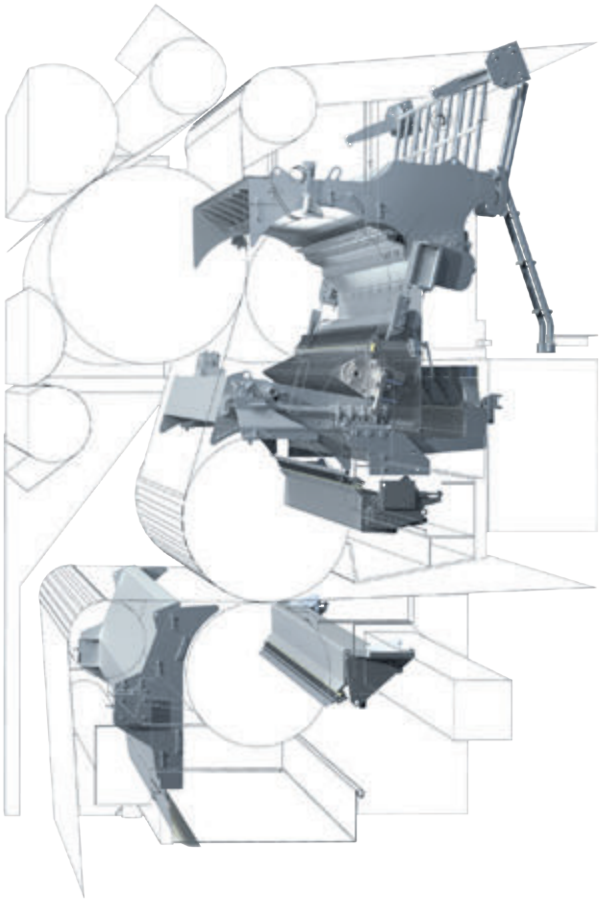
Ecopump Turbo blowers

Vacuum is created as a result of moving air across a restriction. Fans, turbo blowers and liquid ring pumps can be used to achieve this. Often paper mills use a combination of these.

Turbo blowers have the benefit of being an inherently efficient way of compressing air for the modest compression ratios (less than 3,5) we face at a paper machine. A turbo blower is, for a given rotational speed and impeller design, a constant compression ratio device as opposed to a liquid ring pump which is a constant displacement machine.

The power consumption of a turbo blower is a function of the air flow that is being compressed to satisfy the pre-determined compression ratio. A constant speed turbo blower has a limited range of efficient operation since paper machine vacuum adjustment outside of the designed level requires throttling.

Each vacuum element in the machine, such as suction box and suction roll, need a certain amount of air flow to operate at an ideal vacuum level. The needed capacity is depending on felt life and type,



Fit for purpose doctoring design.

Ecopump turbo blower.

> “Runtech engineers have done thousands of vacuum system audits and dewatering studies at paper mills over the last 20 years”

paper grades, basis weights, machine speed etc. Traditional liquid ring pumps and fixed speed blowers cannot cater for these dynamic vacuum and flow needs, resulting in, often significant, waste of energy. Ecopump turbo blowers are designed to operate efficiently across a wide range of vacuum levels and air flows to allow paper mills to optimize vacuum levels while taking advantage of the higher efficiency a blower has over a traditional liquid ring pump device. High speed motors developed driven by frequency converters allows a typical RunEco blower to provide paper machine vacuum levels between 30 and 70 kPa.
Wide range impeller designs allow high efficient levels across the operating range. This means that the amount and the usage of throttling valves can be reduced to a very minimum. The result is 30 to 70% energy savings compared with traditional vacuum systems. Further, Ecopump turbo blowers operate without the need for sealant liquid (water) so contribute to water savings in a paper mill plant.

Vacuum system and dewatering audits

As we know, vacuum demand varies with different paper grades, felts and machine speeds, therefore a tailor-made solution with flexible and variable capacity can balance the supply and demand, resulting in both optimized dewatering and minimized power consumption.
For those reasons Runtech is performing professional vacuum system and dewatering audits, prior to a rebuild project, for its customers.
Runtech engineers have done thousands of vacuum system audits and dewatering studies at paper mills over the last 20 years. Those studies and audits enables Runtech to benchmark the effectiveness of existing vacuum systems, dewatering equipment, suction elements, fabrics and felts. These pieces of information come together in a, often stepwise, rebuild and upgrade plan that will result in minimized operational expense coupled with production increase and runnability improvements. ●

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website: www.runtech.fi

Managing complexity is in TecnoFerrari DNA, as Tecnoferrari dealt with automation since 1973, following the growth and development of the ceramic industry since the very beginning to this day, gaining knowledge and experiences in an industrial sector that has identified in automation the key to success before others.

by: TissueMAG

The multiple forks for picking and transporting at the same time up to 3 pallets. Positions of the fork regulated automatically according to the pallets dimensions.

Today TecnoFerrari can boast expertise and flexibility in its approach to storage systems and applies this valuable know-how to many other working areas as paper, food, beverage. The over 2000 AGV systems installed with laser or inductive guidance vehicles allows designing and implementing the most suitable customized solution for the required application. There are many production processes that require one or more storage phases before the completion of the final product. In these cases TecnoFerrari system, based on AGV technology (or LGV according to the guidance system used), can connect the various production stages and manage the intermediate product parking, with extreme precision, improving performance and productivity. The range is completed by all the fixed loading, unloading and handling machines necessary for conveying the product until the end of the working cycles. TecnoFerrari offers a fast track towards success to every company, regardless of their size, since automation means:

- Maximum safety level for operators;
- Completely automatic functioning;
- Process control and optimization of the production cycle;
- Time and working precision;
- Perfect control over all process stage;

TecnoFerrari: innovation in **automatic handling** and **storage systems.** Over 2000 AGV automatic guided vehicles installed worldwide

▼ Handling of paper rolls and lifting/lower to another level of the installation.

- Cost reduction;
- Ability to interface with other production techno ogies;
- Data protection and collection;
- Versatility of the system and limited workings for track extensions and modifications;
- Reliability and sturdiness of the vehicles.

Key of the success: customized and innovative solutions

TecnoFerrari automatic vehicles are provided of laser or magnet guided automatic system, adaptable to every plant needs and to any kind of product. For both systems the structure of the vehicle is the same, with many advantages for what concern the maintenance and the spare parts. The automatic guide of the TGV is suitable to manage any type of UDC.

Change battery system

Automatic battery change for continuous operation 24 hours/day without the need of manpower for the change. When the battery charge is low the vehicle, when finished the mission, goes automatically to the battery charging station. Change happens in few minutes. Models also exist in which re-charge takes place automatically in a partial re-charge station. In this case the vehicle dedicates all block times to auto-recharge of the

Supervision system

- The supervisor, while processing complex procedure for traffic management TGV, has been designed to be as simple and intuitive as possible;
- The interface is facing the front of the system, with a graphical representation as realistic as possible;
- Interface with eye-catching graphics and 3D representations;
- Visual representation and realistic vehicles;
- Realistic visual representation of machines bays;
- Ability to zoom the areas concerned;
- Access to features visual, intuitive and immediate;
- Accessing data through a simple click on the synoptic;
- Quick and easy connectivity to the most popular database for data exchange with external systems;
- Connectivity devices with Android Tablet and / or Smartphone for monitoring the status shuttles.

batteries, without operator intervention. Allows for continuous operation.

Automatic vehicles for heavy transport

TecnoFerrari automatic vehicles (TGV) are battery-powered shuttles that move automatically following a track of permanent magnets inserted into the floor. They allow a wide variety of applications. They are heavy duty designed and can transport up to 15,000 Kg. The four lifting device placed at corners of the shuttle can lift simply structures where jumbo rolls can be stored or structures with roller or chain conveyors. The structure is lifted, transported to the destination where is lowered on the floor pan. Structure can be left there waiting to be free from the load. The shuttle without the structure can start a new mission. In case of the structure with conveyors they transfer the load to other conveyors. One application is the handling of pulp bales.

> “TecnoFerrari can boast expertise and flexibility in its approach to storage systems”

Handling and storage

Paper Roll storage by means of vehicle equipped with clamps. Rolls are stored on top of each other reaching height of the column of 8 m. Maximum intensity of storage; no structure needed; handled material are loaded/de-loaded in any type racking structure: Conventional, Drive in, Live storage by means of roller track.

Safety

The vehicles have sophisticated and reliable active and passive safety systems for continuous control of the surrounding space, to prevent accidental blows; these safety devices are virtual programmable laser bumper, mechanical bumper, side straps, sound and flashing signals. ●

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NASH
by Gardner Denver

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> “Renova’s Moviroll roll pushers allow the operator to easily and safely move tissue paper rolls”

Moviroll roll pushers allow the operator to easily and safely move tissue paper rolls of up to 20,000 kg.

Renova's Moviroll roll pushers

Renova's Moviroll roll pushers are ideal to move tissue paper rolls with or without plastic film cover. Thanks to their compact and handy design, they can easily operate across the plant also where forklifts cannot.

by: TissueMAG

▼ Moviroll roll pushers are ideal to move tissue paper rolls.

Moviroll roll pushers are designed, manufactured and assembled on site at Renova, Italy (Milan). This allows the company to quickly work at competitive prices and to be able to support the customers with the highest quality standards also on personalized projects designed on customer specifications.

High performance over the time

Renova's Moviroll roll pushers are compact, handy and heavy-duty and allows the operator to easily and safely move tissue paper rolls of up to **20,000 kg (44,100 lbs)** and of a maximum roll diameter of **4,500 mm (178")**. Their maximum lift force of **5,000 kg (11,000 lbs)** allows

Pneumatic models are also available. MR L models for tissue paper rolls use the power of a high quality pneumatic gear motor powered by pressurized and lubricated air at 6 bar. MR models are provided with air supply kit, which is inclusive of spiral pipe, lubricator filter and pipe fitting.

▲ Battery Moviroll models are pioneers of eco-friendly roll pushers.

◀ Moviroll MRE LPT model has been designed for tissue paper rolls.

to easily place rolls on shuttle carts of up to 5 cm height. MRE battery powered models are equipped with a 24 V DC IP 44 motor powered by a high performance and plug&play 24 V lithium battery. The life span of the battery is very long, in fact it is equal to about 500 recharges of the battery. It ensures the operator to move 60-120 rolls with only one battery charge (3-5 shifts). The battery status LED will easily indicate when the battery needs to be recharged with the original battery charger provided by Renova (rapid battery recharge in maximum 4 hours).
Moviroll MRE are provided with second battery optional. Plug & Play batteries allow quick battery changes in less than 10 seconds without the use of tools and/or electrical disconnection, thus ensuring continuity of the operation.
Moviroll MRE LPT model has been designed for tissue paper rolls as it is equipped with oversized roller ideal to handle soft material rolls. All battery models are maintenance free with a battery warranty of 1 year (a 24 month warranty instead is applied for all the systems).

High safety level in plant

Moviroll roll pushers meet the safety standards laid inside the plant as they prevent injuries by helping the operator to easily and effortlessly move paper rolls across the plant with no more fork lift track needed close to the machine.
Besides, battery Moviroll models are pioneers of **eco-friendly** roll pushers as they are the first-in-industry roll handling systems equipped with lithium battery, which is completely free of any environment polluting acid also dangerous for the operator. All models are managed by TUV-ISO 9001. ●

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Consumer Tissue in Greater Europe.

Saturation in the West vs Significant Unmet Potential in the East

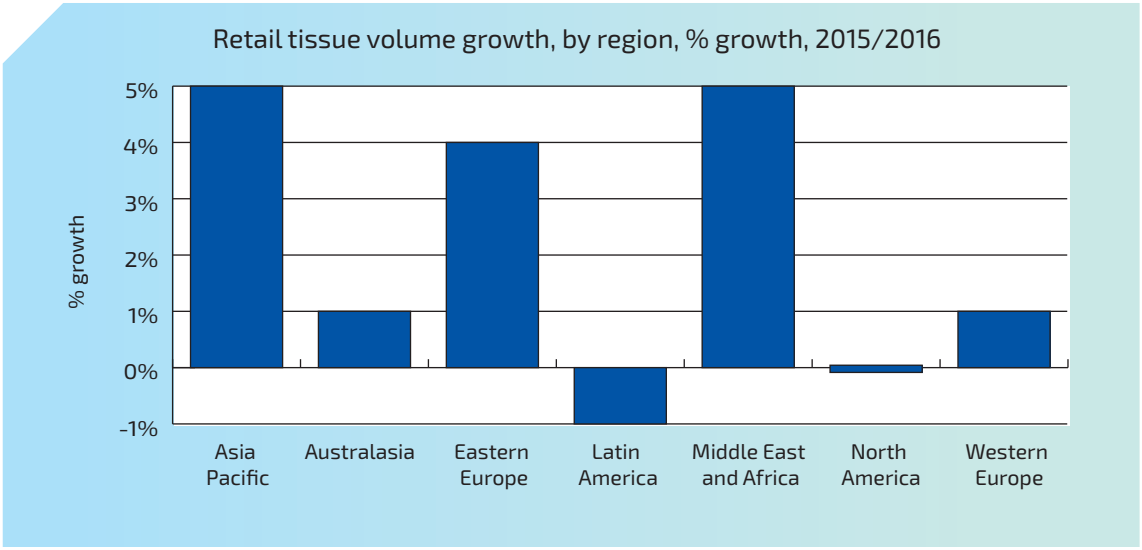
Despite economic and political headwinds in a number of markets, the consumer tissue industry continues to expand globally. In 2016, retail tissue sales recorded positive growth worldwide, increasing in volume by 2% to reach 23 million tonnes.

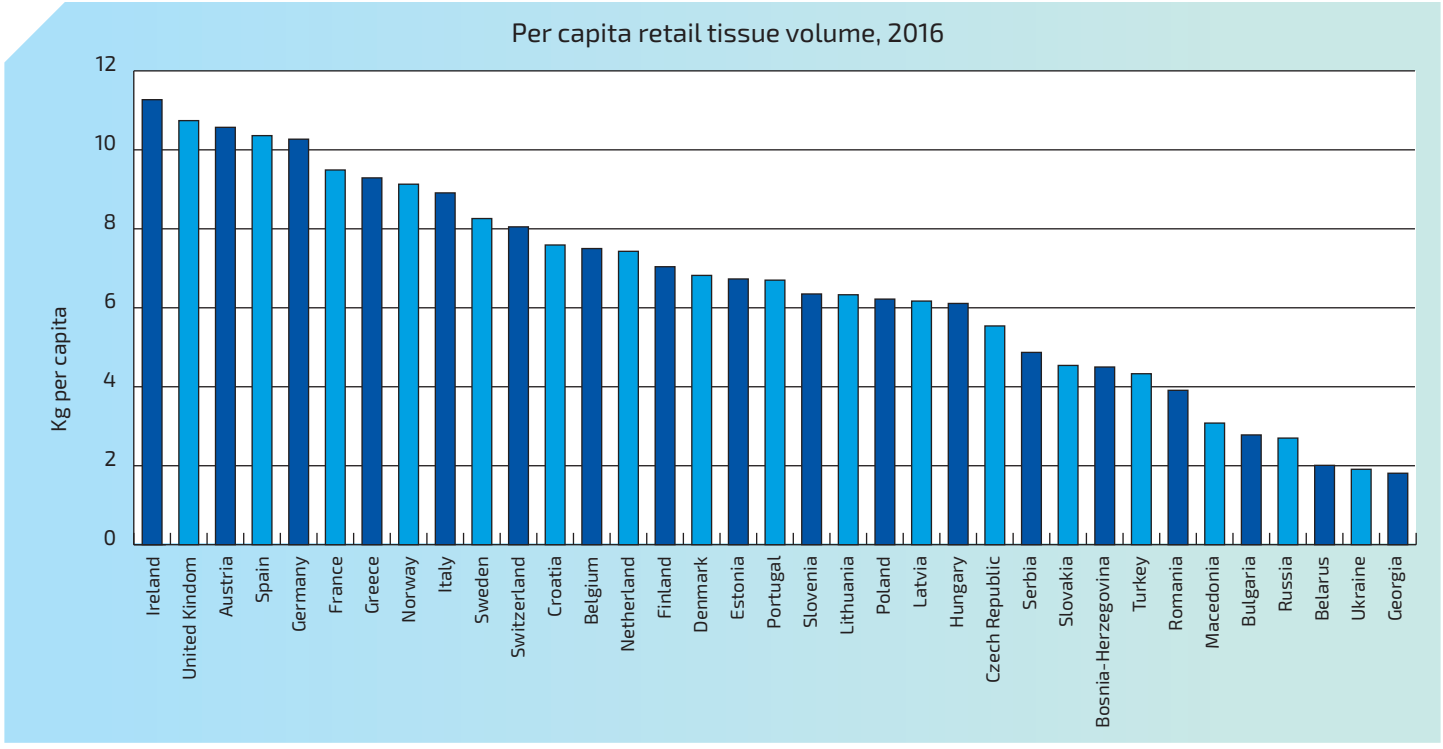
by: Irina Kusazeva, Research Analyst at Euromonitor International

▲ Irina Kusazeva.

Eastern Europe ranked third in terms of growth, after Asia Pacific and the MEA regions. In 2016, retail consumer tissue sales in Eastern Europe recorded a 4% volume increase. Lower levels of per capita consumption in the region, compared to North America and Western Europe, leave room for further household penetration and industry growth.

On the other hand, at a regional average of 8.7kg per capita, demand for tissue products in the majority of Western Europe is seeing only marginal growth, due to market saturation and slow population growth. The exception is found in Turkey (tracked by Euromonitor as part of Western Europe). However, the political instability that characterised the Turkish market throughout 2016 can be expected to seriously hamper the region's ability to reach this potential in near future.





> The consumer tissue industry continues to expand globally

Bargain hunting in Russia benefits private label

Until the onset of economic recession in 2014, consumer tissue in Russia demonstrated healthy volume growth in retail, outpacing the European average. Over 2011-2016, consumer tissue retail sales grew by an 8% volume CAGR, expanding by an additional 120,000 tonnes. Per capita consumption of retail tissue products went from 1.9kg in 2011 to 2.7kg in 2016, up by nearly 30%.

However, the pace of growth in 2014/2015 and in 2016 was only about half of that observed in the prior years, as the impact of economic and political struggles became increasingly difficult for Russian retail, with weakened consumer purchasing power restricting demand for consumer tissue.

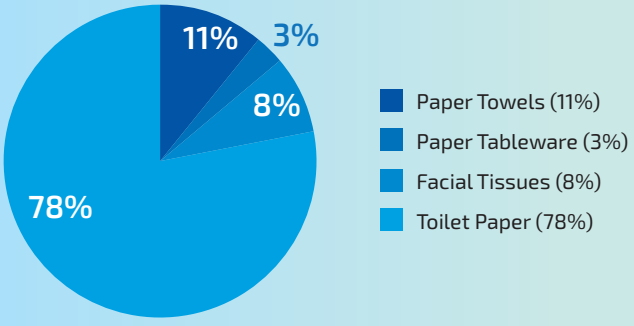
Financial difficulties, however, have contributed to notable gains for private label tissue. While private label has led retail tissue in Western Europe for a long time, in Eastern Europe the concept of private label is relatively new. The expansion has been further supported by the rise of modern retail chains and investments by the leading retailers like Magnit and others into product production, supply and development. The latter trend has also led to growing consumer trust in the quality of private label products.

Private label in Western Europe

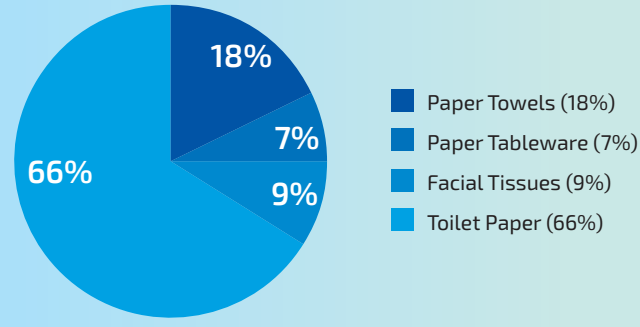
Achieving positive volume growth in 2016, private label continues to dominate Western European retail tissue sales. As a share of total tissue volume, private label held steady at 55% of sales in 2016. With private label players accounting for 79% of retail tissue volume sales, Germany represents the strongest market for private label tissue, both in Western Europe and globally. This is largely due to the strong market positions of leading domestic discounters like Lidl and Aldi. In the UK, the second largest retail tissue market in Western Europe, shoppers have become accustomed to making purchases only when discounts are offered.

This behaviour has developed in large part as a reaction to a fierce price war among British grocery retailers. Initiated during the 2008/2009 financial crisis, the size and frequency of the discounts offered on tissue products peaked in 2014, as branded players brought unit prices almost to parity with private label. It has to be said, however, that as players have been reducing the depth of the price cuts they are still able to trigger spikes in sales. As a result, some brands saw success maintaining or increasing the frequency of discounting while backing off from the size and depth of actual price cuts.

Retail tissue split in Eastern Europe, 2016



Retail tissue split in Western Europe, 2016



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> Private label continues to dominate Western European retail tissue sales

Toilet paper is the key category, but paper towels show more dynamism

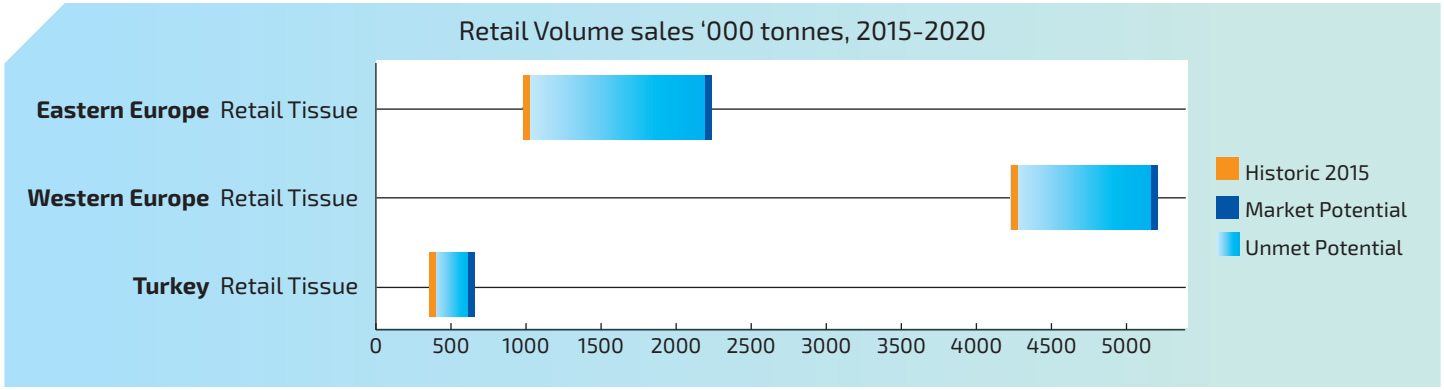
Cocooning, convenience, and innovation support growth of paper towels, which recorded positive growth in both Eastern and Western Europe, at 6% and 2% CAGR in retail volume over 2011-2016, respectively. Similarly to overall tissue, 2014, 2015 and 2016 saw a slowdown in sales of paper towels in Eastern Europe, due to economic downturn. However, on the whole the category is maintaining a positive trajectory.

Toilet paper remains the key product category across Europe, with high levels of saturation in Western Europe (at 5.7kg per capita in retail toilet paper) but still a significant unmet potential in Eastern Europe (3kg per capita). In 2016, the category continued to record healthy gains in volume in Eastern Europe, with a 5% rise over 2015. However, in Western Europe the pace of growth was much slower and mainly supported by population growth. Facial tissue and paper tableware are trailing behind in volume terms. These are also often hit harder during economic crises and are see more as a discretionary purchase, which can be substituted or skipped altogether while budgets are tight.

Look Ahead: Recovering East vs Slow West

The Euromonitor International Forecast Model indicates strong, as yet unrealised potential in Eastern Europe retail tissue; potentially as much as 1.5 million tonnes. In contrast, over a third of unmet potential in Western Europe is due to low penetration in Turkey.

Improving socioeconomic conditions and habit persistence are anticipated to be key drivers of future retail tissue growth in Eastern Europe, also supported by further product development in both private label and



branded value-added products. Excluding the threat of major economic or political upheaval, the rivalry amongst brands and private label will continue to dominate the competitive landscape of retail tissue in Western Europe. A general recovery in the leading national economies will likely encourage consumers to be more receptive to value-added innovation.

Nevertheless, many successful innovators are not likely to see high returns on their investments as high saturation across most markets sees rivals, particularly within private label, eager to adopt successful innovation and undercut the originator in order to gain share. ●

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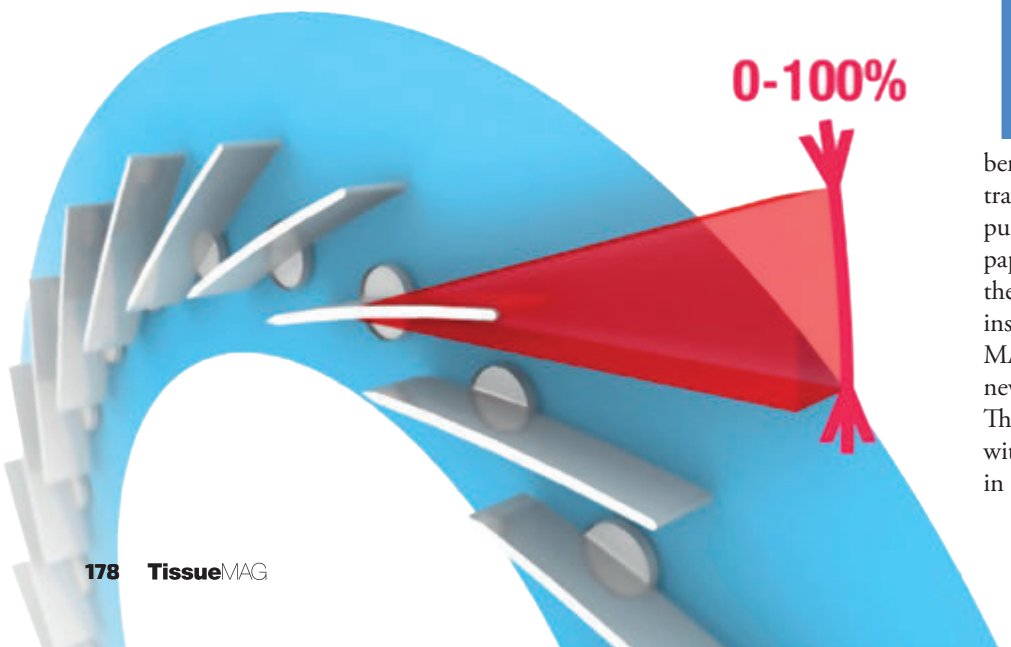
TURBAIR® vacuum systems save 40-50% production costs on paper dewatering

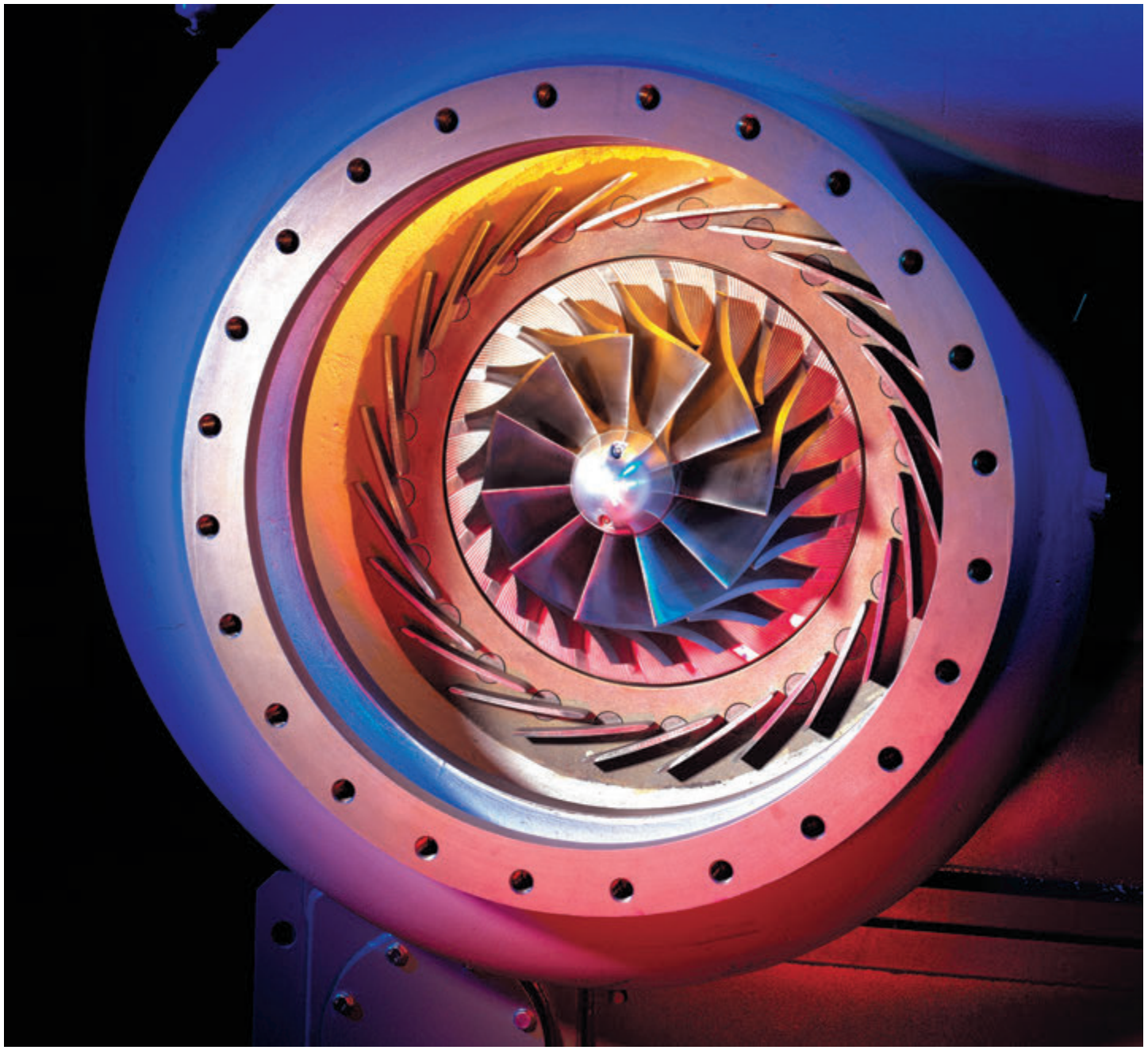
MAN Diesel & Turbo in Zurich continues to expand its market share in the tissue segment. Tissue manufacturers are increasingly equipping their production facilities with TURBAIR® vacuum blowers.

by: TissueMAG

▼ Automatic airflow regulation.



Rising energy prices and growing environmental awareness have led to a sales boom for MAN's vacuum systems in the tissue segment over the last 10 years. Sanitary paper manufacturers appreciate the many benefits of blower technology compared with traditional vacuum generation using water ring pumps. Vacuum systems play a central role in the paper production process. They are deployed at the point in the production process at which the installation dewaters the paper using vacuum. MAN's one-stage RT is now very widely used for new tissue machine installations.
There is also a fast-growing trend towards conversion, with the old vacuum systems previously installed in existing tissue machines being replaced with RT



▲ Type RT TURBAIR® vacuum blower.

blowers. The RT 56 is most popular for the narrow 2.8 m tissue machines with production speeds of up to 2200 m/min, while the larger RT 71 is the preferred model for 5.6 m tissue machines.
MAN covers all the usual manufacturing processes: conventional crescent former, TAD (through-air drying), ATMOS (Advanced Tissue Molding System) and Advantage NTT technology for producing sanitary paper.

Resource-efficient and cost-saving dewatering

The sustained success of the single-stage TURBAIR® is based on a number of factors:

- Compared with traditional water ring pumps, a TURBAIR® blower from the RT series requires only about 45-55% of the absorbed power.
- The volume flow changes depending on the age of the felt: the air volume requirement is controlled automatically by diffusor blades regulation. The aim

is to achieve consistent dewatering over the felt.

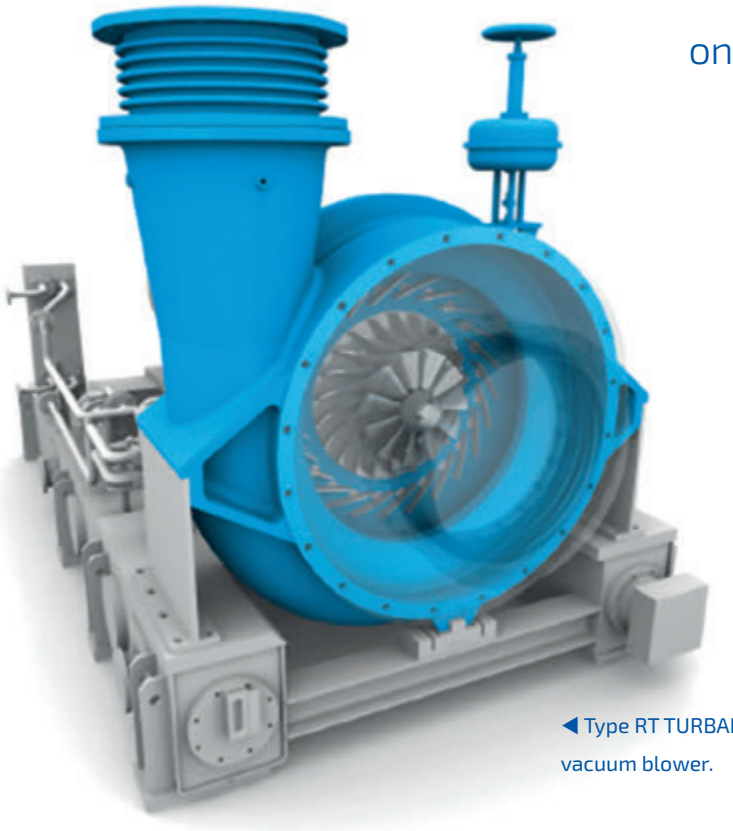
- The RT has a frequency-controlled drive: the vacuum may be adjusted to a wide range of tissue weights and types.
- TURBAIR® blowers do not require seal water, so no fresh water and no cooling tower is required.
- Vacuum blowers have no wearing parts, making them dependable and maintenance-friendly.
- The base frame for the RT series bolts straight to the floor, resulting in a very compact design.
- The efficiency of the water separation process has seen considerable improvement in recent years, making it possible to extend the cleaning intervals for the concrete or steel separator.
- The blower exhaust air can be sent to a heat exchanger (from single- to three-stage), which discharges the blower at a temperature of 120-130°C and thereby recovers up to 70% of the absorbed energy.

"In combination, these benefits result in a simple return-on-investment calculation for our customers: the amortization time of a TURBAIR® system of this kind, installed in an existing paper production mill, is less than two years," says **Manfred Dobler**, Head of Paper Industry at MAN Diesel & Turbo. Following here a small selection of references for new tissue installations: SCA in Germany; WEPA in Germany, France and Poland; FRIPA in Germany; HAYAT in Turkey, Russia and Egypt; Ipek Kagit in Turkey; METSÄ-Tissue in Poland; First Quality Tissue in the USA; Sofidel in Poland and USA and many more. A few references where TURBAIR® blowers replaced the existing vacuum system: Kimberly-Clark in Spain and the USA; Sofidel in Belgium; LC Paper in Spain; Georgia-Pacific in Spain and many more.

A large number of satisfied sanitary paper producers confirm the successful use of TURBAIR® blowers in tissue manufacture and show that huge cost savings can be made on paper dewatering. ●

Type RT 71-1 TURBAIR® vacuum blower.

> "Huge cost savings can be made on paper dewatering"



◀ Type RT TURBAIR® vacuum blower.

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Effectively solving tissue production, converting and packaging problems using event capturing camera systems

▲ High resolution camera.

Increasing demands for operator safety, faster production speeds and enhanced product quality make it imperative to have visibility of all production processes.

by: Martin Rempel - Papertech Inc. - Hamburg, Germany

High resolution cameras and comprehensive event capturing and quality inspection software not only deliver full process visibility, they also provide the opportunity to address issues at their root source, allowing overall machine efficiency (OEE) to be maximized without jeopardizing operator safety.

DISCUSSION

Full visibility into all production processes is fundamental to the overall success of any tissue operation and yet most operators are not able to answer a resounding "yes" to the following questions.

- Can tissue machine, converting line, packaging line and palletizer processes be safely observed?
- Is there a means on every machine to visually capture an unwanted process event and to find its root cause?
- Is there a means of viewing uninterrupted video footage from the past 24 hours (or more) of process?
- Is there a means of identifying and eliminating poor quality product at the end of each process stage?

These questions can be answered with a "yes" if a high speed and high resolution camera-based event capturing and quality inspection system bas been fully integrated into the process of

▲ Web inspection provides real-time analysis across the full width of the wire to record and classify defects.

operating each machine or line. Simple visibility can be provided by any surveillance system; however, full synchronized process visibility, with automatic event and quality analysis can only be achieved through advanced event capturing, web inspection and discreet item inspection systems, such as Papertech's set of TotalVision solutions.

The motivators that warrant an investment in such solutions are:

A - The need for efficient high quality production

• **Excessive process interruptions -** Is the tissue machine operation interrupted by frequent web breaks? Would solving the root cause of the breaks improve the plants return on assets? Web break footage can be acquired by an event capturing system through strategically located cameras-each synchronized to see the same web area to ensure rapid root cause analysis.

• **Product quality problems -** Are converting operations inefficient as a result of an unacceptable number of product defects in finished reels? An advanced event capturing system with web inspection capabilities can map and classify defects. Together with additional critically located cameras, the system can often show the defects' root causes.

B - Eliminating converting bottlenecks

• **Operate with knowledge of incoming product quality -** Could

knowledge of the quality of incoming product improve converting line setup and reduce process interruptions due to web defects? Could product quality be improved by running reels of lesser quality as middle plies on a multi-ply re-winder? OEE increases can be achieved via the automatic receipt of accurate reel quality maps (provided by a web inspection system on the tissue machine) at the converting line.

- **Excessive process interruptions -** Could process engineers, who are presented with the increased challenges of complex converting sequences, solve converting issues quicker with visual information? A typical re-winder may experience process interruptions due to faulty transfers, improper web tensioning, poor web quality, incorrect embosser setup, laminating problems, incomplete perforations, log formation issues, vibrations and log bounce and improper core insertion. An event capturing system is the only solution for capturing these events for slow motion playback and root-cause analysis.
- **Ensuring a high quality end product -** Can assurance be provided that end product meets the customer's minimum requirements? Without knowledge of incoming product quality and the ability to measure quality parameters, the end product is often packaged in the "good faith" that it meets customer quality requirements. However, top tier converters have started rejecting product based on base sheet flaws and monitoring other quality factors using camera based quality inspection systems.

C - Eliminating packaging and palletizing problems

- **Excessive process interruptions -** As on a converting line, could process engineers solve packaging issues quicker with visual information? Packaging lines and are enclosed, high-speed processes and an event capturing system provides the only alternative to capture and present issues that occur in the packaging sequence.
- **Ensuring a high quality end product -** Can assurance be provided that the package and placement of the product inside of the package meet the customer's minimum requirements? Inline camera based quality inspection systems are able to see and alarm on package flaws as well as when product is incorrectly positioned inside of clear wrappers.

These are just a few examples of how event capturing and quality inspection systems can meet the needs of tissue producers and converters.

▲ Web Monitoring Systems have become more intuitive allowing operators to quickly and efficiently find the root cause, or origin, of their break causing defect or other quality issue.

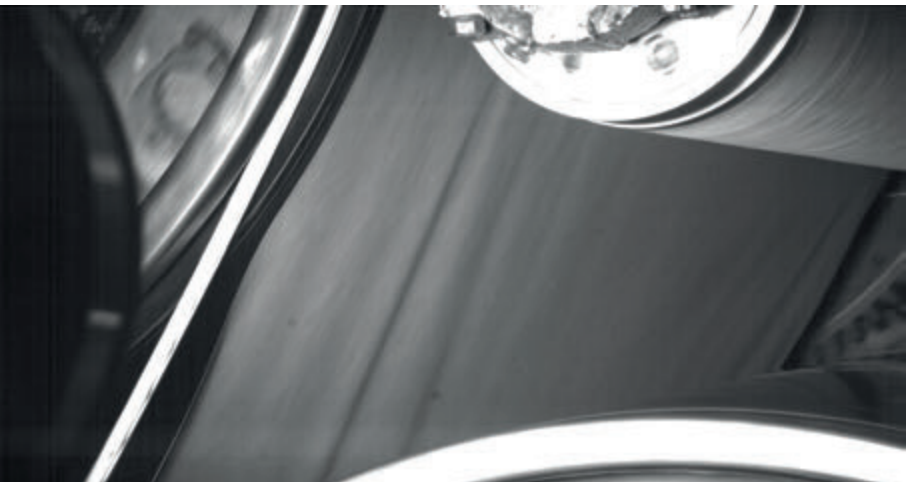
▲ Multiple cameras views showing defects.

RESULTS

An event capturing and quality inspection solution investment will typically provide the quickest payback and provide the largest return on investment under the following scenarios.

1. Rapid and efficient start up of a new tissue machine, converting or packaging line

Visibility and proof of commissioning problems will ensure that a new machine or line is up and running as fast as possible. The return-on-investment is achieved by being able to



▲ Papertech's WebVision software and cameras can monitor a preset region of interest on the paper web and alarm for any change in the sheet.

> “Papertech is the Vision technology vendor of choice for industry leaders in Paper Production in the World”

rapidly find out where process interruptions are occurring and why, as well as finding the sources of quality issues that prevent new lines from achieving desired production output on schedule.

2. Improving the performance of an existing machine

Rebuilding or re-purposing an existing machine for a change in product output and quality poses similar challenges as commissioning a new machine. Also any machine that is production-limited can often benefit from an event capturing solution that provides the ability to resolve unwanted process interruptions.

3. Eliminating poor quality

Product claims can be costly. The ability to measure and document the quality in each production phase-production, converting and packaging can shorten extensive quality investigations. Also the ability to eliminate poor quality product at its production source can provide a very large payback to any organization with quality concerns.

4. Conforming to new safety and operator training regulations-machine guarding

Many operators are faced with decreased or often completely restricted visibility of their machines as a result of newly implemented safety guarding measures. An event capturing solution can not only restore operator-machine visibility, but can also enhance it to levels otherwise unattainable.

CONCLUSION

High speed camera technology for both event capturing and quality inspection has a clear return on investment for tissue machines and converting and packaging lines. Proof of this is the rapid growth in vision based system installations by first and second tier tissue producers who see it as paramount that their assets deliver the best possible OEE. ●

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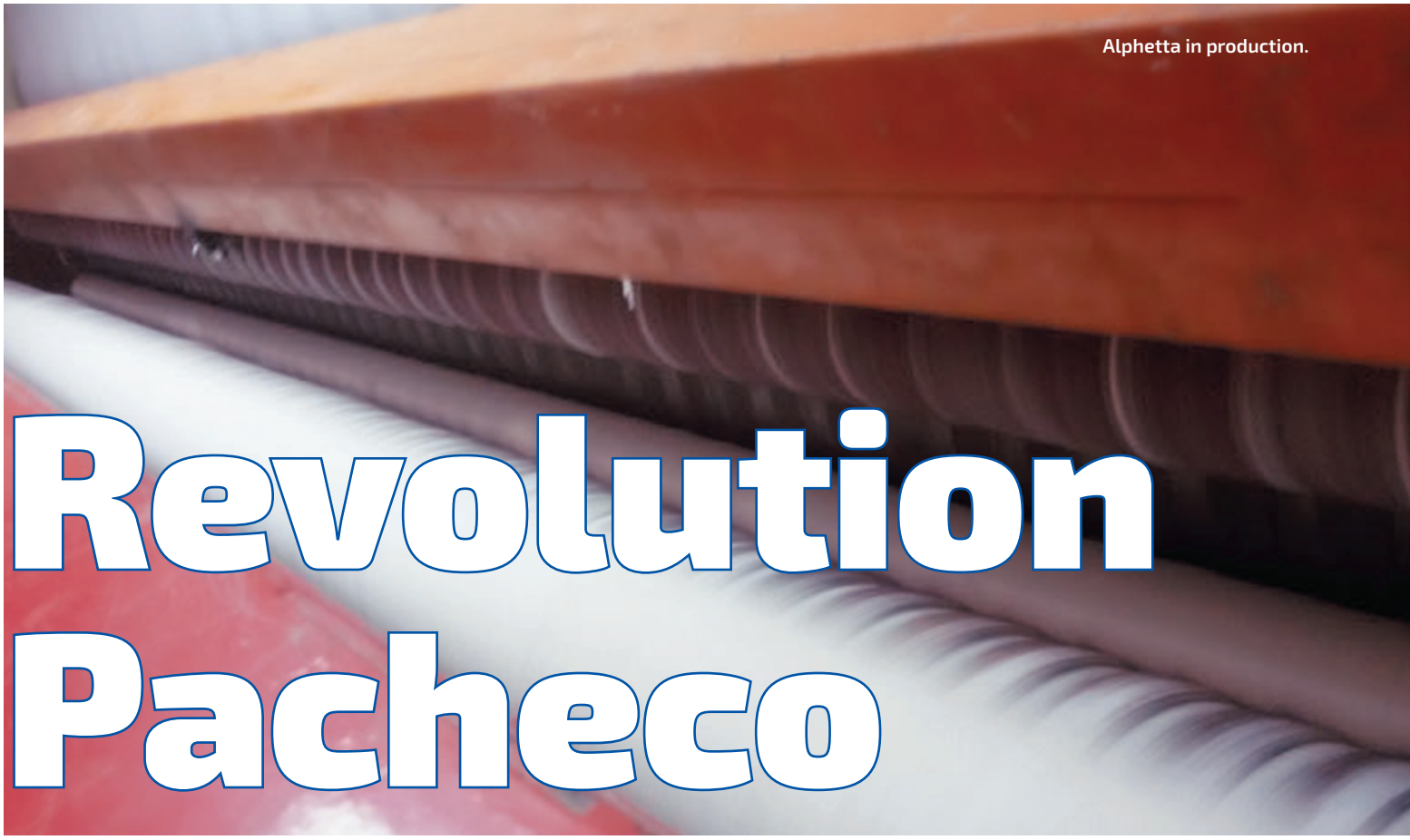


Alphetta in production.

Revolution Pacheco

The future begins yesterday

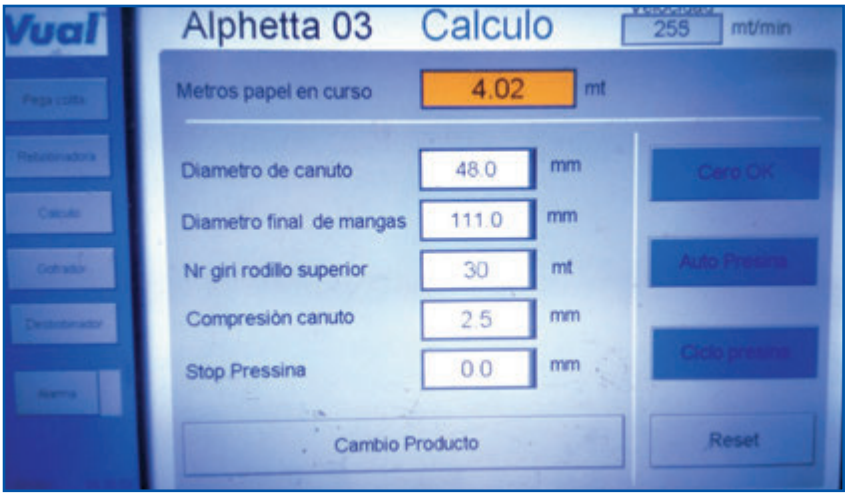
When ideas meet the right people to implement them.

By: Enrico Pieruccini

We now understand why it's possible to build our future by looking into the past. It happened exactly four years ago when Mario Speranza - the President of Celupaper SA - decided to scrap the firm's old manual machines for producing toilet paper with one ply, due to an increase in the market share. The simplest thing to do would have been to buy four or five new machines, train his staff and start production. An operation that wouldn't have been entirely painless for the company: in addition to the economic investment, time for commissioning the machines and training specialised staff (both machine operators and maintenance workers), it could have gone on for too long and not being able to supply the needs of the market. At the risk of making the investment counter-productive. Mario Speranza then thought he'd take a different path, an unusual one. Some years earlier, he'd purchased some used machinery (in particular an Alpha, Alphetta and Bravos) and thought about getting them working again, by applying the newer technologies that the electronics industry had developed in the meantime. Definitely a brilliant idea. To make this "dream" happen, rather than capital, he needed people: technicians who were not

only able to get the machines functioning again, but who could also implement a project to make these machines flexible, and easy to use, even by inexperienced operators and who are designed for producing single-ply paper.
This unusual idea of Speranza's - whose name [in English: "hope"] confirms the Latin saying "Nomenomen", or "a name, a destiny" and 'Speranza' which says a lot - this suggests Typhoon (Typhoon, 1903) by Joseph Conrad, a seafaring novel in which the protagonist, Captain MacWhirr, an old sea-fox who has spent his life with sailing ships, finds himself facing a terrible typhoon off the coast of China, in command of a steamship that for him, is entirely new. To address the needs of a typhoon, he had to make a choice, take a decision immediately. The sea, as the market, is just not going to wait. And MacWhirr, without losing a moment, makes his choice. It is an unusual choice, "creative": disregarding the navigation manuals that encourage sailing around "rotating" typhoons, he puts his ship at the heart of the typhoon, and it survives. Just like Mario Speranza, who also followed the unconventional route.
Creativity is not enough. If a steamboat beats a storm it's because it has a great team.
Everyone on board serves their purpose and gives the most of themselves in work that is arranged to the millimetre: from Mr. Rout, who runs the engine room to the sailors furiously pumping the water back into the sea.
Aware of how important the division of labour and teamwork were to achieving his goal, Speranza chose some specialists in mechanical engineering, and others from electrical engineering to form a team that would devote itself completely to this project. He lacked a skilled technical expert from the world of tissue manufacturing, who would be able to apply new technologies to this old machinery. The choice finally fell on AFD, in the person of Alessandro Giampaoli, a digital designer of software for various machines in the converting world with thirty years of proven experience.
At first, Giampaoli was not very convinced. He was rather skeptical about the success of a project that was going to be implemented in Argentina with no expert support workshops in the paper industry, and the difficulty of finding high quality electrical and electronic materials. Then, however, after having met the technical team, who was composed of highly skilled staff, and having been greatly influenced by Mario Speranza's enthusiasm, Giampaoli realized the project was valid, and accepted the challenge.
We thus began to plan the times for the work, and decided to take the delicate components that were more difficult to find on local markets and sourced them in Italy. Brands were chosen for reliability and high performance, like Yaskawa, sold via ZF

◀ Main page operator panel.



▲ Page of product calculations, simple - but not simplistic.

> "Giampaoli realized the project was valid, and accepted the challenge"

Alphetta in production.

AFD srls

The province of Lucca has been considered as the main European area for the paper industry, and among the more important in the world. The "Paper dust" has entered into all economic sectors of our industrial fabric, as has the story of AFD, which was born out of this dust. We started working at companies that were building machines for processing, when electronics and automation was in its infancy. We saw the first PLC on-board machines, instead of the old relay logic, the programming of the first axis controls and of the first industrial networks. In 1989 we created the first electronic "Pressina", and participated in the Gemini project, the first converting machine with dedicated axis controls and first-generation brushless motors. In 1995 we started to manufacture interfolder machines, that were recognised as the fastest and most productive on the market. In 2007, AFD was born, giving rise to machines such as the I-Jet500 for industrial roller and interfolding IMFOLD. Currently we are working with several transformers around the world. Finally, and the most important thing, we are not just a technology supplier but above all, we listen to and implement the ideas of entrepreneurs that looking ahead.

Italia, for the electronics components, and Wittenstein for the gearboxes. The performance criteria that had to be achieved with the various machines were defined, and were aimed at achieving maximum ease of use of the machines, to allow even inexperienced operators to use them to the max. It was decided to standardized the graphic of operator panel to allow an interchange of operators without losing productivity. In addition, all of the mechanical and pneumatic components that could be replaced by a motor were removed: like the clutches, pistons, mechanical cams, were replaced with inside precision reducers, brushless motors and axis controls.
Between 2013 and 2016, six lines were put into service, that made Pacheco the Argentinian plant with the largest number of automatic machines for processing single-ply paper.
Currently, the machines are working at a production speed of 400 m/min. On each machine you can change the product (final diameter, meter card, etc.) without stopping it. The know-how about the machines was available to the Celupaper technicians: this allowed downtime to be kept very short in the event of a breakdown.

Meanwhile, Mario Speranza continues to look ahead: he wants in fact to further automate production cycles at Pacheco by bringing in new machines for packaging and logistics, aware that in order to make successful investments, in addition to capital, he also needs ideas and people who are able to make them happen. Just like MacWhirr commanding the steamer NanShan, Speranza knew how to exploit his creativity and ideas, and how to choose the right people who would make a difference. It is precisely this that makes him a successful entrepreneur. ●

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BINET SUL LIRI

New technological enhancements for **Tissue Felts**

A tissue felt must be a concentration of textile, mechanical, hydraulic and hydrodynamic technology. It must support the sheet which must adhere closely to the felt, it must be transported from the forming zone to the vacuum zone to the pressing area, firmly held and then released without uncertainties when it reaches the yankee cylinder.

by: Binet sul Liri S.p.A.

Tissue felts cannot bear any irregularity, nor any defect. Even just one fiber sticking out from the felts surface is enough to impair the quality of paper produced. So, if for traditional paper types we can use "rather simple" felts, for tissue paper instead, exceptional products are required that only few producers in the world can manufacture.

At Binet Sul Liri S.p.A., research and development are a meticulous constant and the challenge represented by felts for tissue machines is a primary concern. Therefore we have developed a number of specific technical tools either for felt designing: FELT ENGINEERING. Than for technology evolution: SOFT-TOP and TWIN-TOP, and also for prototype trial testing - FELT TEST.

Here are a few notes on these topics.

FELT ENGINEERING

It's an exclusive software created, tested and now daily used by Binet sul Liri for designing of its felts.

It is able to calculate all of the most important technical characteristics of the felt using equations deriving from physics of porous means, for example:

- distance between fibers in microns;
- open surface in cm^2/m^2;
- length, diameter, tortuosity of capillaries in mm and microns;
- percentage of contact surface;
- percentage of achievable dryness;
- effective pressure of the fibers on paper in Kg/cml;
- pressure drop at the suction box;
- sum of loading loss in meters of water column in every section of the felt;
- felt thickness, new, compressed and critical thickness in mm;
- total deformation and deformation of every section of the felt in mm;
- total weight and weight of every section of the felt in gsm;
- total air permeability and permeability of every section of the felt in cfm;
- width of the nip in mm with and without the felt;
- water eliminated in l/s;
- drain speed in mm/s;

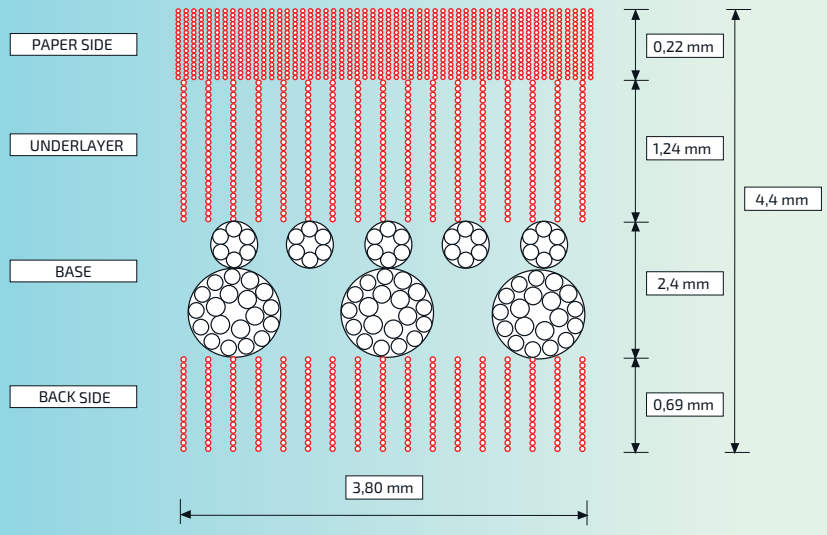
- active volume in cm^3/m^2;
- operating void volume in cm^3/m^2;
- optimal needling density in strokes/cm^2;
- optimal needling depth in mm.

Advantages: evaluation, during design phase, of all technical characteristics of the felt to be produced and of all the possible implications deriving from every adjustment made.
This way, often, a first felt supplied can perform better than standard ones.
The alternative: use of felts designed by similarity of position and production and eventually adjusted through following supplies. Commercial standard felts can give an acceptable efficiency and life-time when well designed and produced, FELT ENGINEERING guarantees optimization of machine clothing. Like all other components of the paper machine, felts can be designed and produced using engineered methods instead of being produced empirically as done till today. This is the only way to optimise product's performance and moreover the efficiency of the press. In fact a conventional felt can result to be a good felt when it is well designed, but it's unlikely to be the best felt achievable, as like a Binet felt!

SOFT-TOP and TWIN-TOP

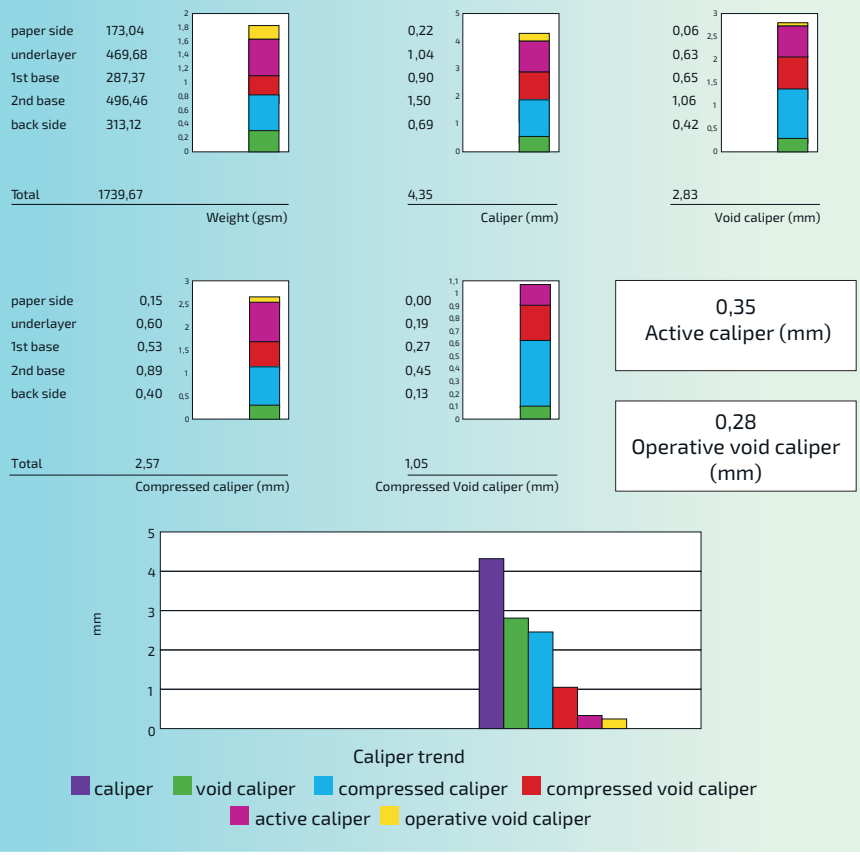
One of the main problems in the tissue field is represented by the necessity to generate a very fine and dense paper side surface on the felt with the purpose to achieve: an excellent pick-up and holding of the sheet; filtration of the filling materials; high dryness; low re-wetting.
To reach such goals, usually fine fibres and an intense needling are applied.
The inconvenience of such procedures consist in the transportation of the fine fibres through the structure of the felt, producing a densification of also the internal layers, causing air and water permeability reduction.
Consequently felts can become difficult to condition and to keep clean.
The system planned by Binet Sul Liri S.p.A. consists in the dissociation of the paper side functions with those of the rest of the felt: the paper side is built as a very light and perfectly consolidated baseless felt,

CROSSWISE SECTION



CROSS WISE SECTION O F THE FELTWITH HIGHL IGH TO F LENGTH AN D C ALIBER O F CAP ILLARIES IN THE SEVERAL SECTION S AS C ALC ULATED BY FELTENG INEERING

CALIPER TREND



meanwhile the complex of the base fabrics and of the internal batts trace the typology of a standard felt. The two manufactured products are then assembled by means of particular procedures in order to maintain a very fine and dense surface along with a relatively open and permeable internal structure. To describe it synthetically and efficiently, we likely named this baseless structure "SOFT TOP®".

Our tissue felts have gained so much from such application that in the majority of the cases they result to be of better-quality in comparison to the standard.

Recently we have subsequently developed the concept by applying two light SOFT TOP structures instead of only one heavy structure, thus achieving other incredible advantages such as: highest speeds; reduced energy consumptions; production flexibility; extreme cleanliness

> "At Binet Sul Liri, research and development are a meticulous constant"

of the felt and of the fabric in particular on Crescent Former machines; up to 50% more lifetime than the standard; extreme regularity of the profiles.

Such innovation, identified as "TWIN-TOP®", seems to be the most interesting development of the tissue felt technology on the market at the moment.

"SOFT-TOP®" and "TWIN-TOP®" are trade-marks by Binet Sul Liri and are exclusive applications of our firm.

FELT TEST

It is the squaring of the circle. It is a guiding system that allows you to test on a real sample designed on the basis of the customer's requirements, the ability of the felt to:

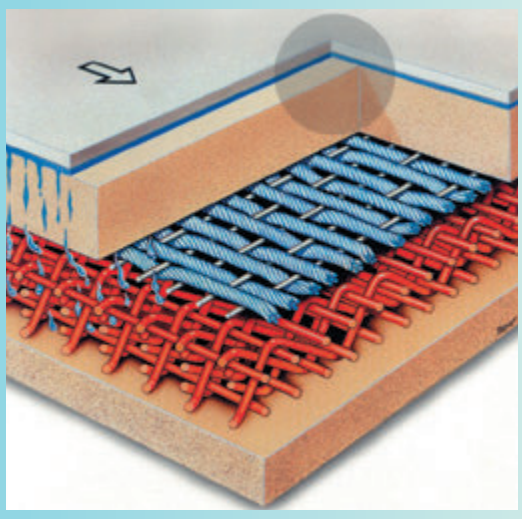
- quick start-up;
- give the required amount of water to the vacuuming elements and to the

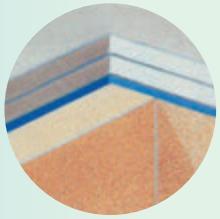
NIP at the required speeds and with the available air flow;

- monitor evolution over time in terms of thickness, permeability and also water handling.

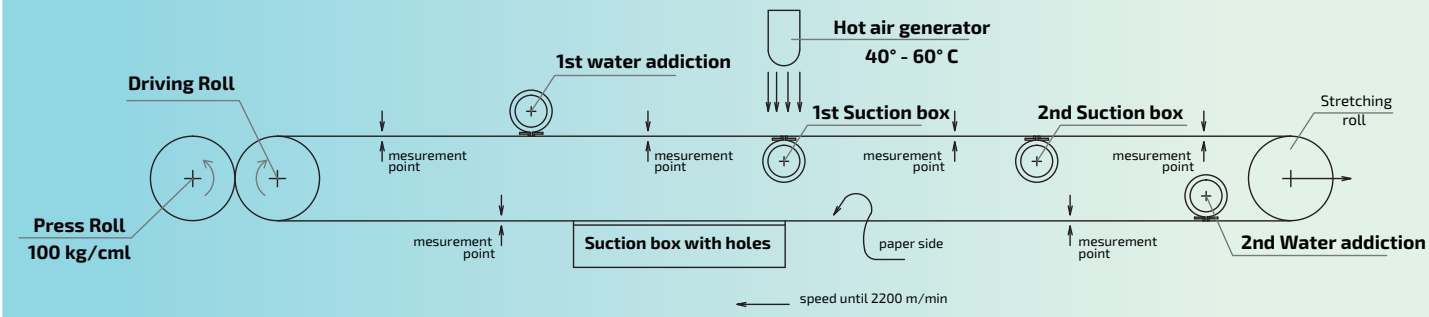
A full test of a sample measuring 8,0 m x 0,5 m, takes up to two weeks' time and simulates a number of NIPs on the actual machine equal to 60-65 working days. Longer time may be necessary for special requirements. Measurements are taken once per hour on the first day to simulate the start-up, then once daily on the subsequent days corresponding to a once a week survey on the real machine.
The maximum speed of the pilot press is of 2200 m/min, the pressure of 100 kg/cml, therefore in line with the maximum commercial needs. There are two adductions of water, one to simulate the contribution given by the sheet, the other to simulate the one given by the washings. There are then two suction boxes with slots to simulate the conditioning and a suction box with holes measuring a meter lengthwise to simulate the suction press. After each element there is enough operational space for the insertion of measuring instruments concerning the water content and felt permeability. There is also a hot air generator to simulate the effects of the vacuumed air temperature on the performance of the felt.

SOFT-TOP® & TWIN-TOP®





FELT TEST



Conclusion

Thanks to these particular computer and technology tools, Binet Sul Liri is a candidate to be the most powerful supplier of tissue felts of the third millennium. Our developments and our conclusions are available to all manufacturers of paper machines and all paper producers in order to enhance and improve their productions and their technology. ●

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The TSA - Tissue Softness Analyzer

The industry standard for an objective testing of softness, roughness and smoothness

With an increasing wealth globally, customers more and more demand a tissue product with optimal characteristics for the respective application.

by: TissueMAG

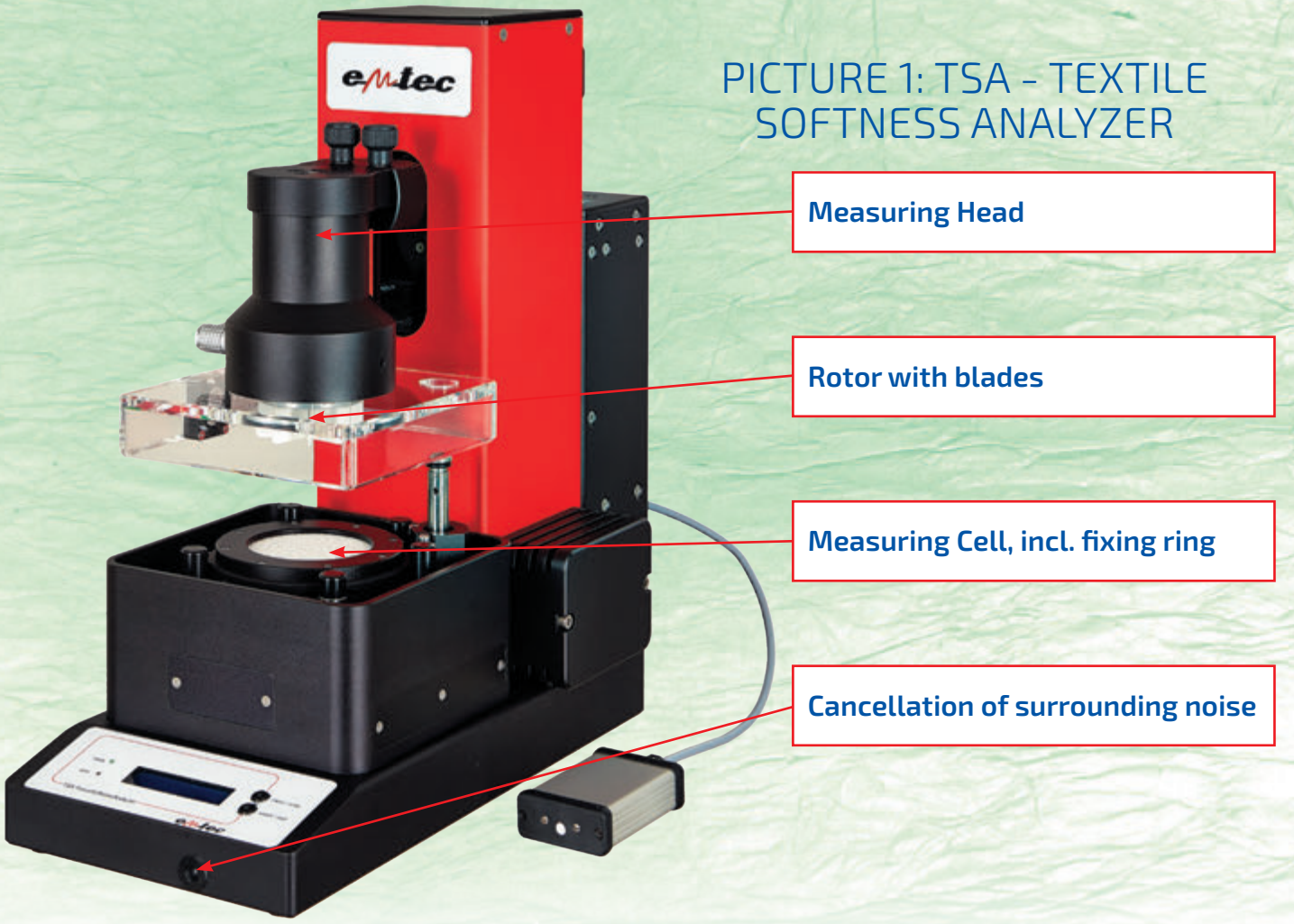
Kitchen roll is supposed to absorb exactly the right amount of liquid and needs to have the right strength, hankies need to be smooth and toilet paper should be as soft as possible. Standard testing devices or measuring methods exist for the measurement of absorbency and strength as well as for the measurement of the overall feeling or touch of the material. Traditionally, human hand panels helped to measure the overall feeling. In the past years the emtec TSA - Tissue Softness Analyzer helped to shift the measurement of softness, roughness and stiffness - the parameters that determine the overall human feeling - on a much higher and objective level.

▲ On the left you see: FPA touch! Fiber Potential Analyzer. On the right you see: CAS touch! Charge Analyzing System.

Measuring principle

The device measures the three basic parameters that determine our human hand feeling, the real softness, which comes from the fiber stiffness; the roughness, which

PICTURE 1: TSA – TEXTILE SOFTNESS ANALYZER

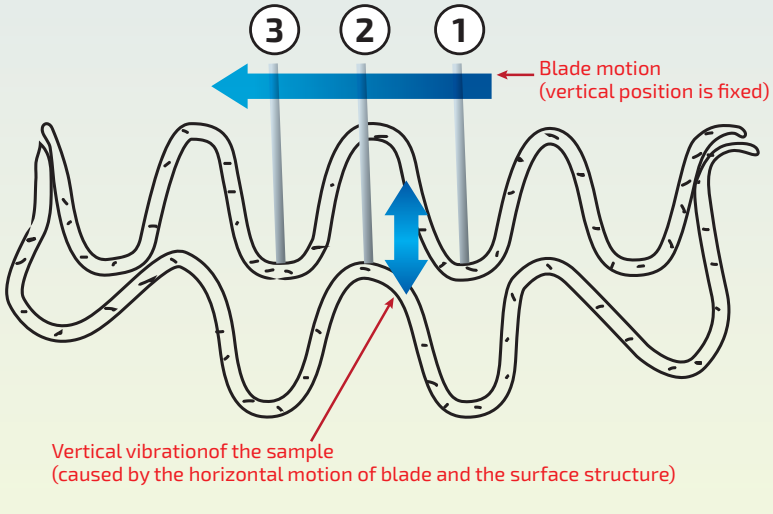


comes from the surface profile of the sample; and the stiffness, which is determined by the fiber behavior, the production technology and chemicals.
The TSA measurement is a two-step measurement. The first step is a sound analysis, where the real softness (TS7) and roughness (TS750) are measured. The second step is a deformation measurement, where stiffness (D), plasticity (P), elasticity (E) and the hysteresis (H) are measured. Calculated together, TS7, TS750, D, P, E, H etc. give the hand feel (HF) value (***Picture 1***).

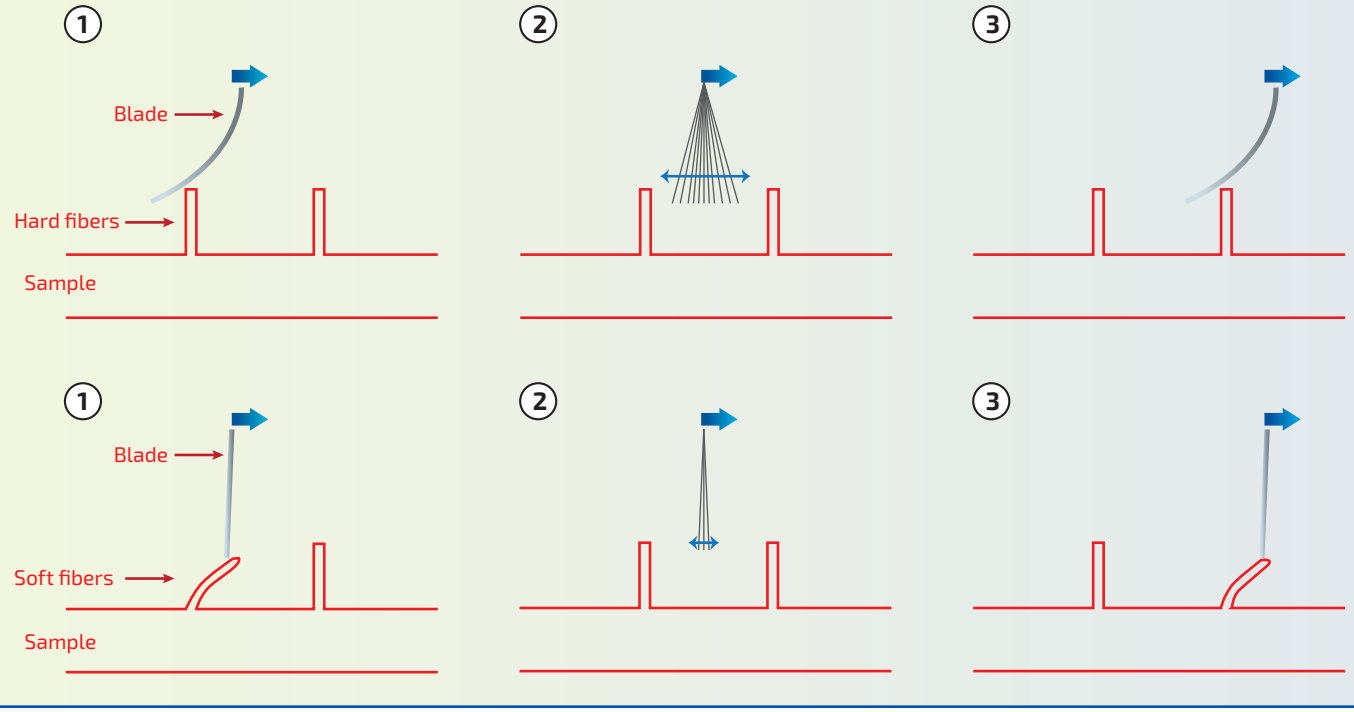
First step – noise measurement

Once the measurement is started, the rotor with its eight blades is moving down to the sample and starts to rotate, the blades touch the sample while rotating. The rotation over the sample is usually done with a load of 100mN. By this rotation, two different types of vibrations are caused, (1) one is the vibration of the sample itself and (2) one is the vibration of the blades (***Picture 2***).

PICTURE 2: MEASUREMENT OF THE ROUGHNESS

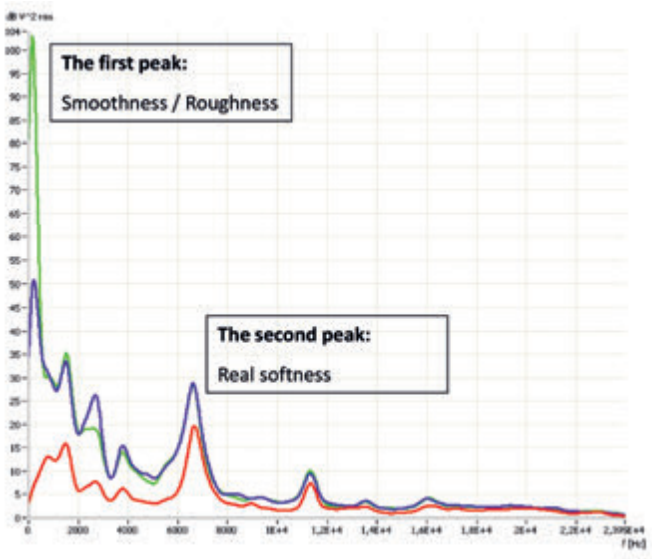


PICTURE 3: MEASUREMENT OF THE SOFTNESS



> TSA - Tissue Softness Analyzer helps to shift the measurement of softness, roughness and stiffness

PICTURE 4: NOISE SPECTRUM



(1) The vibration of the sample

The rotor is fixed in vertical direction, but moves in horizontal direction over the sample. A 100mN load is applied on the sample. According to its surface profile, the sample itself gets into vibration. This vibration causes a noise, which is recorded by the microphone that is located underneath the sample.

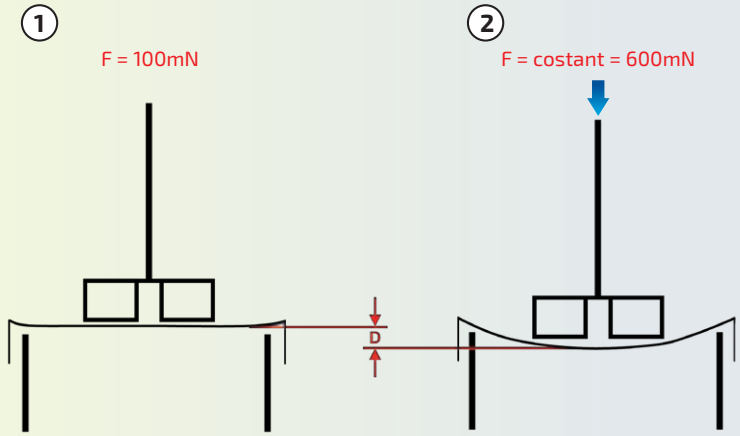
The result can be seen in ***Picture 4***; the first peak in the noise spectrum represents the roughness.

A higher peak means a louder noise, a louder noise means more vibration and more vibration means a rougher surface.

(2) The vibration of the blades

The blades move over the sample and the fibers that are sticking out of the material, again with a defined load of 100mN. If the fibers of the material are hard and stiff, it is also hard for the blade to move over these fibers and once the blade moved over the fiber, it will get into strong vibration (stick and slip principle). If the fibers are soft, it is easier for the blade to move over these fibers and thus the blade does not get into a vibration, which is as strong as if the fibers are hard and stiff. The vibrations of the blades cause a noise, which is recorded by the microphone underneath the sample. A stronger vibration causes a louder noise; a less strong

PICTURE 5: DEFORMATION MEASUREMENT



vibration causes less noise. The result can be seen in ***Picture 4***; the second peak in the noise spectrum represents the real softness of the material. A lower peak means a softer material; a higher peak means a harder material. The higher the peak in the noise spectrum, the louder is the noise that is recorded.
A louder noise means more vibration and as ***Picture 3*** shows, a stronger vibration means harder fibers.

Second Step – deformation measurement

In the second step of the measurement, the deformation of the material is measured aswell as the elasticity, plasticity and the hysteresis. A load of 100mN to 600mN is applied to the sample and the deformation and other parameters, such as elasticity, plasticity and hysteresis are measured. The deformation is measured in mm/N, which means that a higher number indicates a more flexible material and the other way around.
The availability of these three basic parameters - roughness/smoothness, real softness and stiffness/deformation - allows the use of the device in various application areas.
The manufacturing process can be optimized in several ways; an example is the chemical consumption (e.g. softener chemicals or lotion), another one, the setting of machine parameters or the optimization of the blade lifetime. Having the three basic parameters available that determine the human hand feeling is a great achievement. Never before, it has been possible to measure these three parameters individually. Of course humans are able to detect differences in real softness, roughness and stiffness, but only if the quality of the tested material is far away from each other - e.g. comparing a piece of sandpaper with a piece of silky material, extremely rough against extremely smooth. From the single parameters - real softness, roughness, stiffness etc. - a hand feel value can be calculated, which correlates very well with the human feeling. This is done by the help of different mathematical models/ algorithms. Product and/or region specific algorithms can be developed; this is necessary, because people from different regions of the world have a different expectation in terms of "good feeling". The different algorithms can take this into account.

Application examples

Adding softener in the tissue production/Application of lotion in the tissue converting.
Different methods are used in order to enhance the softness of tissue using chemicals:

- Adding softeners at the wet end;
- Applying softeners on the felt;
- Applying lotion.

In order to obtain good quality at any time and because an objective way to measure the impact of the softener or lotion was not available in the past, both is often overdosed. Of course, a hand panel can help to evaluate the quality of tissue material to a certain extent. However, to achieve results that can be used to quantify the quality of the tested material and to find out where processes can be optimized, huge efforts are necessary: cost are too high, too much manpower and too much time are necessary.
The solution: an objective testing device should be used, the TSA - Tissue Softness Analyzer.

Procedure

1. Measuring the softness of selected samples (tissue raw material) using the TSA, setting delivery specifications;
2. Determining the optimal amount of lotion to be applied using TSA measurements (carry out machine testing with increasing application quantity and use tissue of which the softness is on the lower limit of the agreed specification);
3. Choosing the softener with the best cost-performance ratio;
4. Incoming control of the raw material.

This is just one of many examples, how the TSA can be used to reach several targets at the same time. The example above shows, how the device can be used to optimize the dosage of softener chemicals in the production or of lotion in the converting.
The device can be used from the beginning of the production process (defining the right fiber mix, long/short fibers, virgin/recycled fibers etc.) until the final product (quality control), it delivers objective data; the measurements are repeatable and reliable. No subjectivity disturbs a reliable measurement of the tissue quality anymore. ●

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Short and long pivoting arm design makes the clamps versatile with a wide roll diameter range.

The Bolzoni Auramo

Damage-free Tissue Paper Roll Handling

Forklift attachment manufacturer Bolzoni Auramo has a complete range of clamps for efficient and damage-free handling of heavy loads in the Forest Products logistic chain.

by: TissueMAG


For the damage-free load and unload of vehicles.

These are conceived with the purpose of optimizing each specific handling requirement, allowing forklift operators to enlarge the lift truck application field, versatility and performances.

> “Bolzoni Auramo operates on all continents and on all main pulp and paper manufacturing sectors”

Tissue Paper demand

Bolzoni Auramo follows the market trends showing an increasing demand in handling of Tissue paper rolls. In facts, the Tissue evolving market has stimulated manufacturers to develop new products. To come up with the best solutions, Bolzoni Auramo is closely cooperating with the paper industry worldwide in order to find innovative solutions for the forest products handling.

The Paper Handling Pioneer

Within the paper industry, Bolzoni Auramo is well known for its expertise in paper handling equipments and the company holds a good market position in sales of paper handling tools worldwide.

Products - The Range

“Damage free handling has always been our goal in developing new paper roll clamps” - says **Lars Petersson**, Bolzoni Auramo’s Forest Products Handling Division Manager.
“Bolzoni Auramo offers well-designed and strong paper roll clamps, equipped with built-in damage reduction characteristics as standard, such as: wide capacity and opening range, good visibility, thin and smooth arms, fast and accurate rotation system, total clamping force control, wide range of contact pads to suit all load features”, he continues: “When it comes to Tissue paper handling, special focus has to go on the design of the contact pads”.

Tissue Paper Roll Clamps

Bolzoni Auramo has a wide variety of tissue paper roll clamps, with capacities range from 1.500 to 6.000 kg (3,000 to 13,000 lbs), and roll diameters are up to 2.700 mm (106”) in standard series. All standard tissue clamp models have fast and effective 180-degree rotation, which enables effective handling of both vertical and horizontal rolls. Short and long pivoting arm design makes the clamps versatile with a wide roll diameter range.
Standard tissue clamps are designed for handling on single rolls only, split arm models for handling two rolls are available on request. Special opening ranges, non-rotating and/or forward tilting

> Bolzoni Auramo has a wide variety of tissue paper roll clamps

▲ Contact pad with smooth wear strips.

▶ Tissue clamps arm, built to be handle large diameter rolls.

clamps are available on request for special and specific applications.

Engineered to suit all the application needs

Tissue paper rolls often have larger diameter than the common other paper grades. Sometimes the roll diameters can be very extensive, even larger than 3000 mm (120") diameters do exist. The rolls are often very soft and loosely wound.
Tissue clamps are always built to be able to handle large diameter rolls. They also have higher and wider contact pads to reduce surface pressure on the soft paper.
For larger diameters and softer paper grades the contact pads have a special form which is designed to reduce point loads under the pad edges.
It is very common that large diameter and soft tissue rolls deform somewhat under their own weight when lowered down to the floor in horizontal position. This deformation causes a flat area on the roll which can in some cases be several hundred millimeters wide.
The flat area may cause horizontal roll handling problems unless it is compensated in the clamp design. All Bolzoni Auramo paper roll clamps have in common slim and thin arm design.
This makes the clamps easier and safer to handle in confined spaces.
Arms and contact pads have smooth rounded surfaces and corners all around to reduce the possibility for the clamp damaging the roll. Bolzoni Auramo tissue roll clamp arms have design features which protect the arms and contact pads from wear and tear.
Arms have built-in pad protection loops. This saves the paper roll as worn pad edges can be very sharp and easily tear the paper roll.

Contact pads

Contact pads are the most important part of the clamp attachment. In most normal handling situations, the pads are the only parts of the clamp which actually are in contact with the paper roll.
Therefore, Bolzoni Auramo has paid special attention in designing and manufacturing contact pads which will ensure safe and non-damaging tissue roll handling. Typical for tissue paper rolls is a large diameter, and also roll widths can be extensive. Due to low paper grammage the rolls can be very soft as well. These properties make the tissue rolls prone to external damage and difficult to handle with normal paper handling equipment.
Bolzoni Auramo offers dedicated tissue roll clamps which are built for effective and non-damaging handling. These clamps have a wide range of specially designed contact pads: Single radius,


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◀ Tissue paper roll clamps have higher and wider contact pads to reduce surface pressure on the soft paper.

▼ Tissue clamps models have fast and effective 180-degree rotation, for effective handling of both vertical and horizontal rolls.

Triple radius or Convex radius pads - with wide variety of friction surface options. Besides the contact pads, another key issue in Tissue handling is the excessive clamping force, which is one of the most common causes of paper roll out-of-roundness damage. The varying paper roll hardness, weights and diameter plus the high value of the rolls themselves are all factors requiring an excessive control of clamping force on behalf of the operator. Bolzoni Auramo strongly suggest the use of our automatic clamping force control system, model FORCE MATIC. Thanks to this fully mechanical pressure control system it is possible to prevent over clamping causing roll out-of-roundness.

Worldwide Support

Thanks to the far-reaching service and support network, Bolzoni Auramo can assist customers with any service, rental, spare parts, service training and technical need. "The Driver Training Program is an example of this support" explains Lars Petersson "informing and educating our customer on how to reduce damage when handling paper rolls". Bolzoni Auramo operates on all continents and on all main pulp and paper manufacturing and transportation sectors, concludes Lars Petersson: "Wherever you are with your forest products, we are there with you!" Bolzoni Auramo is a manufacturer of forklift truck attachments, lift tables and forks. The company has manufacturing plants in Italy, Germany, Finland, America and China and through its network of direct branches and independent dealers covering all continents, it is able to satisfy all market requirements. World leader in the market of OEM factory installed products, Bolzoni Auramo is approved supplier for all main fork lift truck manufacturers. ISO 9001 Quality System certification proves Bolzoni Auramo's commitment to continuous improvements in quality and efficiency in order to provide the best product and service support to customers worldwide. ●

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HELIOS

Innovative and **cutting systems**

high tech realization

Nowadays many paper mills deal with downtime due to machine set-up, with the need to produce different cutting measures in a short time and with operators without experience on the plants.

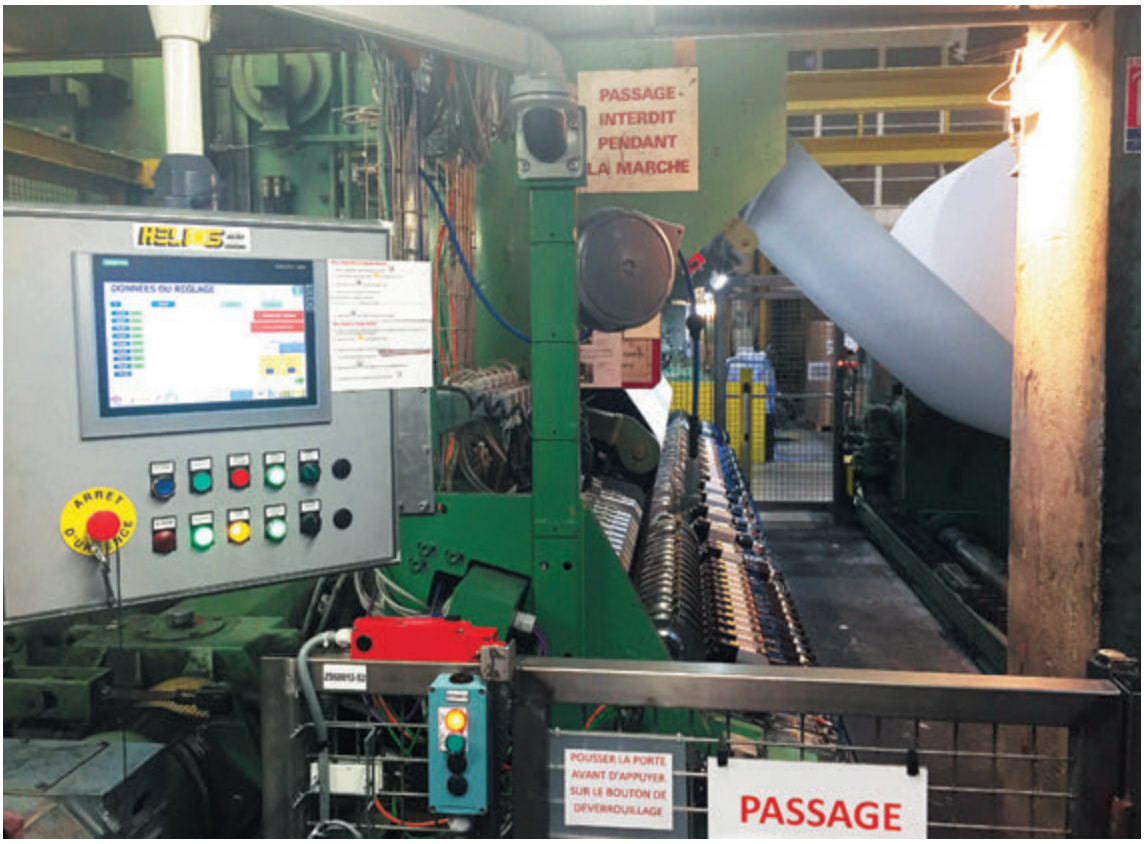
by: Elio Cavagna S.r.l.

▲ Rewinder Beloit to cut cardboard - Original Cutting System before the retrofit.

◀ Rewinder Beloit to cut cardboard - Automatic Helios System, after the retrofit.

Considering these issues, Helios - Elio Cavagna S.r.l. - is able to propose solutions which substantially reduce this occurrence. In the pictures it's displayed an example of manual machine modified in 2016.
In the present case, it's an old rewinder Beloit from the '80s with manual positioning, the cutting area has been changed in order to make it completely automatic. This new solution allowed the customer to cut the paper at a speed of 2,000 m/min and to produce strips of 80 mm, a result obtained also thanks to the supply of independently motorized bottom knives.
This type of system therefore allows you to achieve several benefits, first of all the reduction of down time since the change of blades positioning requires few minutes and can also be carried out with the material into the machine. The high positioning accuracy also avoid waste caused by web rolls out of tolerance and operators don't waste time in adjusting knives. Another benefit, no less important, is that the automatic positioning of the blades avoid manufacturing errors and consequently also the life of the knives increases significantly.

▶ Rewinder Beloit to cut cardboard – Automatic System with touch screen panel.



> The company is one of the leaders of flexible materials cutting segment

In recent years Helios is specializing in the modification of rewinders to increase their efficiency and their production capacity in order to meet the needs of the market.

Leader of flexible materials cutting segment

Established in 1976, Elio Cavagna S.r.l. has always worked and served the segment of paper, converting, tissue, cardboard, fibres, rubber and aluminium, with longitudinal shear, razor blade and crush cutting systems. Today the company is based in a purpose built factory in Galgagnano near Milan. Everything from design and manufacture to assembly and shipping takes place in house. This ensures tight controls to be maintained during the manufacturing process therefore guaranteeing excellent quality with accurate delivery times. Over the years 'Helios' has grown in size and now enjoys a worldwide reputation as a quality manufacturer of innovative knife units and cutting systems.
Innovative and high tech cutting systems realization is confirmed by the huge quantity of patents (in Italy and also abroad) released to our company. Steadfast is the search of new products and technologies able to increase customers production. This can be achieved by systems that eliminate manufacturing rejects, reduce dust, increase blades' life and shorten payout periods.
Helios systems also allow easy cut settings, fast format changes and safe working conditions thanks to patented safety guards. Nowadays the high quality and efficiency results as well as the focus on customer needs and the market understanding has led the company to be one of the leaders of flexible materials cutting segment both in Italy and around the world. With 32 years of experience in the industry and a whole host of materials slit we are sure that Helios can propose a solution to your cutting requirement. ●

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Tecnomec 3, planning and building **spreader roll**

◀ Spreader Roll.

Tecnomec 3 was founded in 1992 and during these years has become one of the leading companies on the world market for production and service of spreader rolls.

By: Tecnomec 3 Srl

Main headquarters is located in Turbigo, province of Milano (Italy). At the same time we were also opened a branch in China for repair the spreader rolls coming from Asian market. We are operating to develop new sites to meet more and a greater demand and be able to make assistance in rapidly developing countries.
Recently it has been acquired an order for an Asian customer for metal spreader roll with cover metal hard chromium plated - body length 10500 mm. and outside diameter of 450 mm. We are always researching and developing for new equipment and new materials. These things garantee to the end customer (OEM Machinery or user) high quality products and 100% made in Italy. Leveraging on the know-how and ability to innovate, our goal is therefore to consolidate the international presence and improve the relationship with the customer. The current trend is to provide high quality products and a very fast after-sales service. Our production include spreader rolls for all kind of applications.
We are able to repair all kind spreader roll's brands as Wittler, Kickert, Robec, Mount Hope, Yamauchi, Spencer Johnston, Finbow and Tevo. ●

> “Our sales dept will give you the best solution to solve your technical problems”

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Karin and Thomas Villforth purchased a JP-5000 high-speed weaving loom in 2015 to increase their company's production capacity for ultra-fine forming fabrics

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VILLFORTH
Siebtechnik GmbH
MADE IN GERMANY
QUALITY

Family business in Reutlingen / Germany invests heavily

Villforth Siebtechnik GmbH - 100 % made in Germany

Villforth Siebtechnik GmbH is a limited liability company based in Reutlingen which can look back on more than hundred years of successful company tradition. Founded as Vereinigte Metalltuchfabriken by Peter Villforth sr, the company has remained 100% family-owned ever since: Mr and Mrs Thomas and Karin Villforth are the fourth generation running the company today. Villforth specializes in the manufacture and sale of synthetic fabrics. It is one of the market leaders in the area of paper machine forming fabrics – all of them are made according to the highest quality standards in Reutlingen, Germany.

2015 was a milestone in our company history. We purchased the most advanced high-speed loom available to date – the JP-5000 from the company Jürgens. This enables us to strengthen our market position; we can now produce an extra of 65 000 m² ultra-fine forming fabrics per year.

We produce customized forming fabrics for highly specialized paper machines, and also solutions for various applications like paper and paperboard converting or the pulp, food, particle board or nonwoven sectors.
With our broadly based corporate strategy, i.e. manufacturing tailor-made fabrics for sophisticated paper machines and specializing in niche rather than mass products, we have firmly established ourselves in the market and are continuously expanding our product range. Our latest developments currently include fabrics for TAD (Through Air Drying) machines, fabrics with antistatic finish or fabrics made from special materials like PEEK and PPS. TAD fabrics are used under high thermal loads; they must be resistant to hydrolysis and dimensional change. Their textured surface ensures the desired softness and high bulk in tissue production. A particular challenge is the stability of seams, which we ensure with a specifically developed technique. Fabrics with antistatic finish are used in machines for (air-laid) nonwoven production. They must be electrically conductive to dissipate the electric charge building up when the fibres are blown onto the fabric during dry laying.

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The 24th edition of MIAC Exhibition is to be held in Italy this October

Machinery, plants and equipment for the production of Paper and Paperboard and for the converting of Tissue Paper.

by: TissueMAG

▲ The aisles of MIAC Exhibition in Lucca/Italy.

MIAC is an international meeting point that allows you to compare the technologies and business proposals of all the companies present at the Exhibition.

The Exhibition

At MIAC, Visitors can meet the leading international companies of the Paper Industry sector. Visiting MIAC means obtaining a full overview of the technology and equipment available to the paper industry sector (**production of Paper and Paperboard and converting of Tissue Paper**). The Exhibitors of MIAC Exhibition present the latest developments in machines, systems and avant-garde solutions to improve the management of the various stages in the paper production cycle.
Taking part in MIAC means being one of 5,000 Visitors from across the globe who meet in Lucca (Italy) in October of each year (last year's MIAC Exhibition registered visitors from 52 Countries).

> "270 Exhibitors, 5000 Visitors: this is MIAC in Lucca (Italy)"

4 International Conferences dedicated to the Paper Industry sector

Participation in the Conferences is free of charge. During the 3 days of Exhibition take place 4 International Conferences, offering very interesting content and studied to provide professional and dynamics information to the participants coming from all over the world. Simultaneous translation is available for all the Conferences.

Lucca area

MIAC is held in Lucca, the only officially recognized "Paper District" in Europe. Italy produces 9.000.000 tons of paper and paperboard every year. The paper industry in Italy boasts significant numbers: 165 Paper Mills, 20,000 workers, a turnover of 6.8 billion Euros.
MIAC: 3 days full of business! ●

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TissueMAG

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Tissue news around the world

USA

Resolute announces start-up of new Tissue machine at Calhoun

The machine will continue its scheduled ramp-up through 2017 and is expected to be producing at maximum capacity toward mid-2018. With its fully operational converting facility, converted tissue products sold from Calhoun are now manufactured entirely from parent rolls produced on-site. The Calhoun tissue operation, built at Resolute's pulp and paper mill, has the capacity to manufacture 66,000 short tons (60,000 metric tons) annually of premium private-label tissue, including bath and towel, aimed at the at-home market.

MEXICO

SCA invests to strengthen tissue operations in Mexico

To further strengthen competitiveness and enable future growth in the tissue operations in Mexico, SCA has decided to invest about USD 105m (SEK 950m) in one of the company's facilities in the country. The investment in Mexico will support SCA's high-quality tissue offering under the Regio brand. The investment is aligned with the company's strategy to streamline production and secure capacity for future growth in order to increase value creation in the Tissue business area.

USA

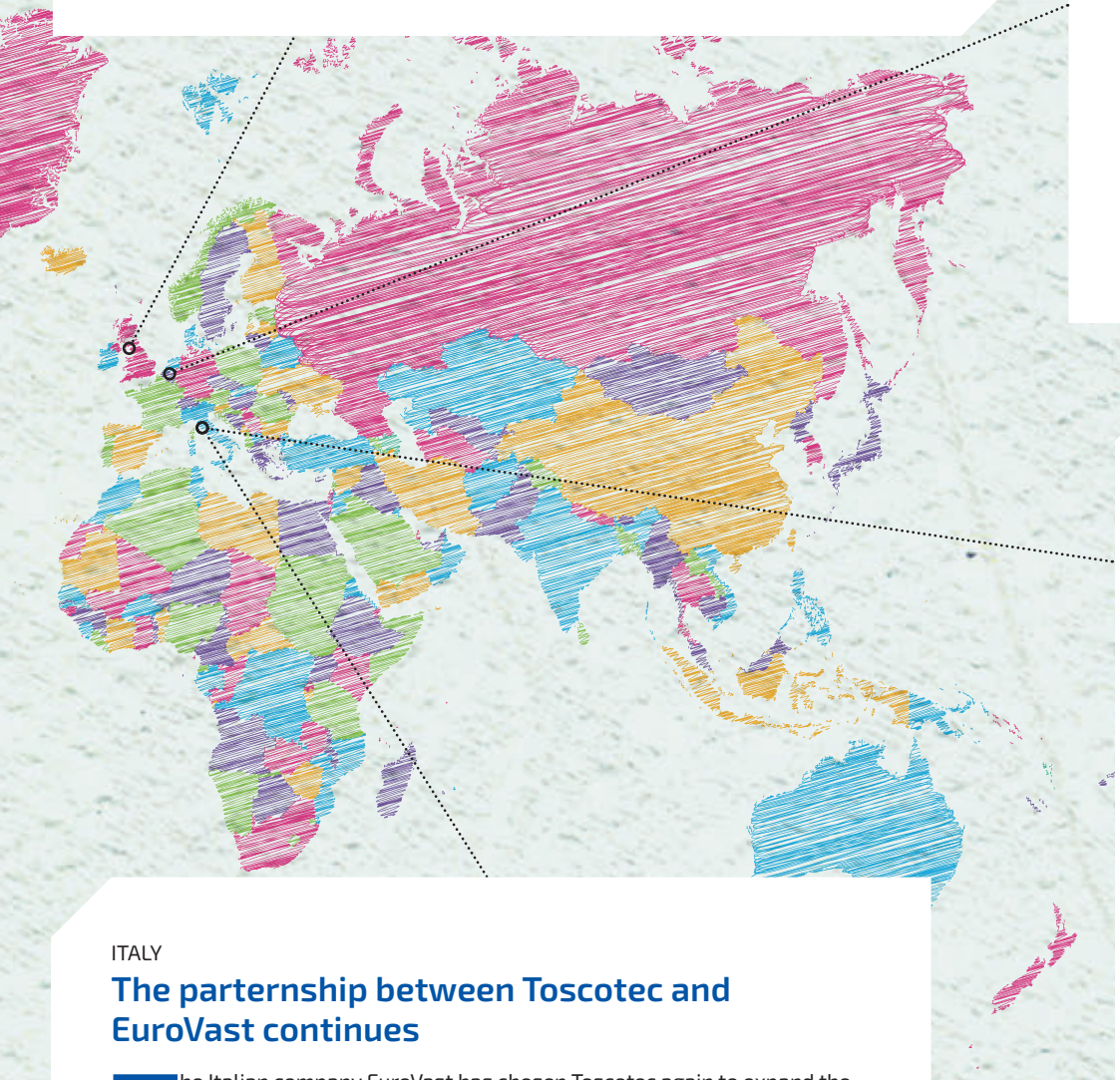
Georgia-Pacific promotes Fischer to CEO

The Atlanta-based unit of Koch Industries said Christian Fischer was promoted to the post after a decade as executive vice president of the company's packaging and cellulose segment. Fischer succeeds Jim Hannan, who was promoted to a broader, newly created job that includes oversight of Georgia-Pacific as well as other units of Kansas-based Koch Industries. Hannan had been Georgia-Pacific's president and CEO since 2007. Georgia-Pacific brands also include Quilted Northern and Angel Soft toilet paper and Vanity Fair napkins.

UK

A.Celli and Sofidel UK: a new start-up spells success!

The start-up of the latest-generation tissue rewinder manufactured by A.Celli Paper and sold last year in the UK to customer Sofidel was concluded on 25 January 2017 with excellent results. In just 8 months, the machine, a rewinder Mod. 865 shafted in a 3400-mm format was built, installed at the Sofidel UK facilities in Lancaster and started up to the full satisfaction of the customers who signed the acceptance certificate. The start-up took place with no delays and is certainly an additional piece added to the mosaic of collaborations that A.Celli Paper is collecting in regards to this major Italian group.



ITALY

The parternship between Toscotec and EuroVast continues

The Italian company EuroVast has chosen Toscotec again to expand the capacity of its Cartiera della Basilica. The new machine, a MODULO-PLUS crescent former with single press configuration, TT SYD-3200MM and TT MilltechHood, is the perfect solution to meet Eurovast's need: high quality tissue product, attention to energy saving and eco-sustainability were determining factors in choosing advanced Toscotec's technology for this project . The new TM with a maximum production capacity up to 30,000 tonnes/year and a paper trim width of 2740 mm will replace the existing suction breast roll machine and will be started up in the last quarter of 2017.

BELGIUM

European paper industy launches bold investment Roadmap

The Roadmap projects the need for €44 billion more investment - a 40% increase on current levels - to transform industry in Europe and lead the low-carbon bioeconomy by 2050. The Confederation of European Paper Industry (CEPI) pioneered in 2011 the first low-carbon industry Roadmap. It is today the first industry to table a blueprint to bolster industry transformation. Today the industry reaffirms its vision that decarbonisation and growth are mutually compatible and calls for a better alignment of policy, research and financing conditions to boost investment in Europe.

ITALY

Sofidel for World Water Day: new partnership with WaterAid presented in Milan

The paper manufacturer, known for its Regina brand, as part of the launch for the new partnership dedicated to water and sanitation, organised a meeting in Milan to understand and explore the many aspects connected to this precious resource. Sofidel, which has always worked to limit the consumption of water in its production processes, through this new partnership is committing to a more general task of raising awareness among its stakeholders and supporting projects that aim to ensure access to water and the availability of better toilets, sanitation and levels of hygiene, in the developing countries where the organisation operates.

Tissue news around the world

USA

Clearwater Paper: second tissue machine and converting facility in Shelby

Clearwater Paper Corporation will build a new tissue machine and related converting equipment for producing premium and ultra-premium grades of private label tissue products at a site adjacent to the company's existing facility in Shelby, North Carolina. The new tissue machine will produce a variety of high-quality private label premium and ultra-premium bath, paper towel and napkin products. At full production capacity, the new tissue machine is expected to produce approximately 70,000 tons of tissue products annually.

BRAZIL

Suzano will invest R$720 million in projects to diversify operating gains in 2017

Part of the investments will be used to build two tissue lines, one at the Mucuri Unit in Bahia state and the other at the Imperatriz Unit in Maranhão state. The production of tissue and lignin, whose startup is slated for this year, represents another step in the Suzano strategy to diversify the returns on asset base, with the opening up of new avenues of adjacent businesses by capturing efficiency and profitability gains in Suzano operations.

BOLIVIA

GapCon tissue S.r.l. to supply a new tissue machine to Copelme S.A. in Bolivia

The Italian GapCon tissue S.r.l. (since 2017 a member of the PAPCEL Group of companies) signed a contract with the Bolivian paper producer Copelme S.A. to supply a new tissue machine (paper width on reel 2,760 mm, operating speed 1,600 mpm). It is a "turn-key" green-field project. The new paper machine will be installed in a new production plant. The company GapCon acts as a general contractor in this project, including complete engineering services, deliveries of all the accessories, mill site transportation and on-site mechanical and electrical erection.

ITALY

Lucart: legality, transparency and social responsibility

The Italian Competition Authority, in agreement with the Ministry of Interior and the Ministry of Justice, renewed Lucart SpA's Legality Rating. Lucart is the first company in the Italian paper industry to have obtained the maximum Legality Rating score, winning 3 stars out of 3. "We are very pleased and proud to have achieved this ambitious goal, which is reserved for only a small number of Italian companies. It's an acknowledgement that rewards consistency and compliance with all the regulations that protect Consumers and the Market" said Massimo Pasquini, Lucart Group's CEO.

ROMANIA

Romanian tissue paper production up 16% in 2016

Romanian tissue paper makers managed to expand their total output to some 170,000 tonnes in 2016, an increase of 16% compared with a year earlier. In the years 2008 to 2016, the country's tissue paper production doubled. The Romanian market is currently estimated to be worth between €400 million and €450 million per year. The three leading players with a largest market share include Romanian producer Pehart Tec, Italy's Sofidel, and Romania's Vrancart Adjud.

ITALY

270 Exhibitors, 5000 Visitors: this is MIAC in Lucca (Italy)!

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EGYPT

Fifth Valmet supplied tissue machine started up at Hayat Kimya in Egypt

Valmet has installed five new machines and provided an extensive rebuild of Hayat's TM1 in Izmit, in Turkey. The new line in Egypt will add 70.000 tons of high quality tissue to the company's current production of facial, toilet and towel tissue. The new tissue machine has a width of 5.6 m and a design speed of 2,200 m/min. The raw material for the new line is virgin fiber. The new line is part of Hayat Kimya's expansion plan in the Middle East where Valmet have supplied five Advantage DCT 200TS tissue lines to Turkey, Iran, Russia and now also Egypt.

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It is a contact point between all the companies supplying the Paper Industry sector and the paper and converting technicians (Paper Mills and Converters).

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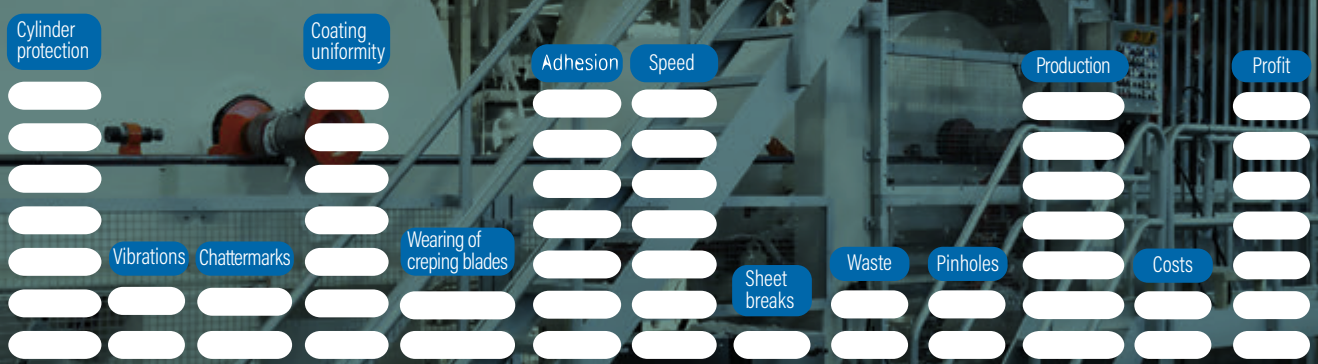

The Yankee cylinder is the heart of the machine and the creping process is the delicate art of the papermaker.
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