INTERNATIONAL MAGAZINE ON TISSUE PAPER MACHINERY AND TECHNOLOGY

TissueMAG

This issue is distributed to Tissue Paper Mills and Tissue Converters in **America (North, Centre, South), Asia + bonus countries**

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NOVEMBER 2019

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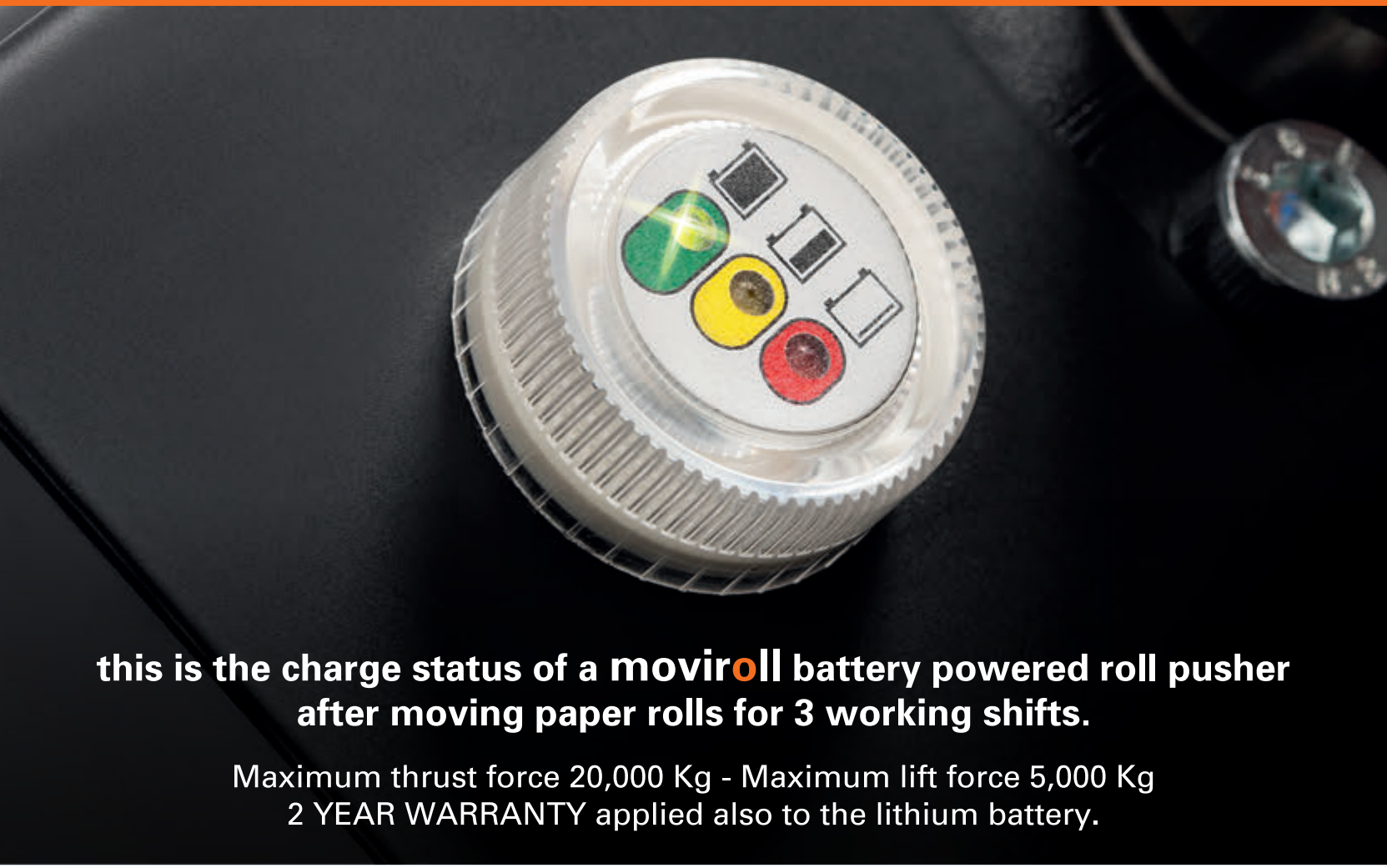
INNOVATION PIONEERS



this is the charge status of a moviroll battery powered roll pusher after moving paper rolls for 3 working shifts.

Maximum thrust force 20,000 Kg - Maximum lift force 5,000 Kg
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*pneumatic version also available

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TissueMAG

NOVEMBER 2019

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TissueMAG - registration number 133 - 11/04/2017 - Court of Milan - Italy.
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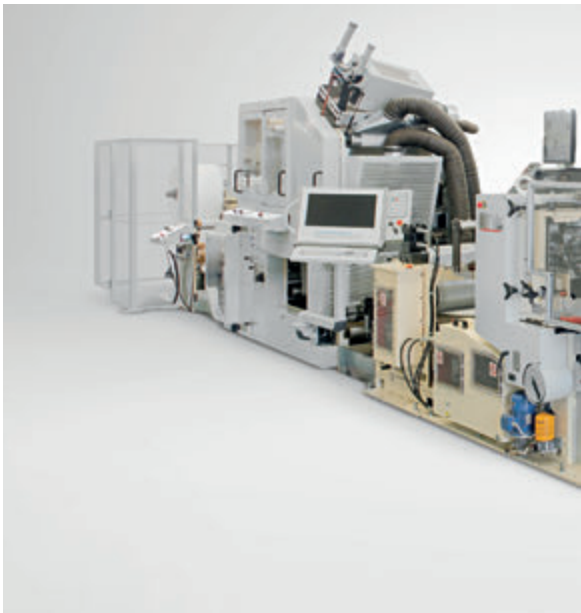
Circulation
2,425 copies



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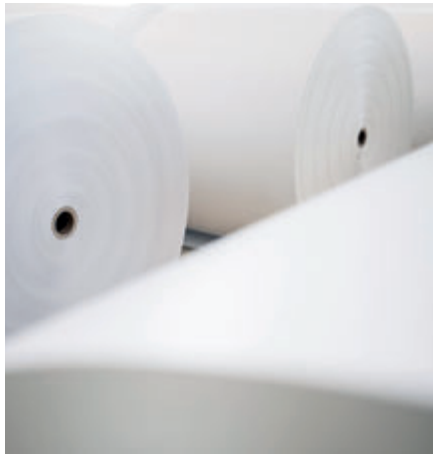


Latest in consumer tissue:

structural challenges in the US, China growth, DTC insurgency

With positive growth recorded in volume and value globally, the consumer tissue industry has something to feel optimistic about. Furthermore, easing of pulp prices and the ability of some manufacturers to implement retail price increases are complemented by a still significant global unmet potential for consumer tissue, estimated at over 17 million tonnes, or over USD 51 billion, in incremental sales.

by: Svetlana Uduslivaia, Head of Research, Home & Technology, Euromonitor International

China and the US remain the world's two largest retail consumer tissue markets, by volume and value, together accounting for nearly half of all global consumer tissue sales in 2018. However, while the US continues to struggle with significant structural challenges, China sees healthy projections ahead. In the US, in volume terms, the retail market saw a decline in 2018, and it is projected to remain largely in negative territory over the next five years. As key macro-fundamentals shape demand and retail sales, slowing economic projections and persistent low levels of population growth (well under 1% annually) will continue to impact the industry. Furthermore, the Euromonitor Industry Forecasting model predicts that US-China trade wars are likely to shave some growth off going forward. While the downgrade in projections due to trade wars is not likely to be significant, any further slowdown in an already sluggish market is not good news. Trade wars can and likely will lead to further increases in prices in retail across consumer goods, in addition to price increases already implemented in 2018, thereby forcing many consumers to re-evaluate their spending priorities and giving cheaper brands and an already strong private label an upper hand once again. **Euromonitor** consumer lifestyle surveys reveal that many consumers in the US intend to increase their spending in discounters and spend more on private label in 2019.

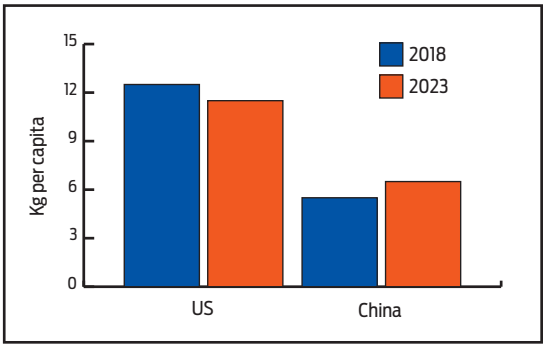
In fact, the proportion of US respondents planning to increase their spending on private label in the coming 12 months went up from 14% in the 2011 survey to 17% in the 2017 survey to 19% in the 2019 survey.

This is not to say that all is doom and gloom for the key industry suppliers and brands in the US. Products that provide tangible benefits to consumers always have their place in households. Thus, for instance, paper towels in the US saw a somewhat better performance in 2018, compared to the previous year. While price increases implemented by key brands and fewer promotions did play a role in boosting nominal value upwards, product positioning and improvements in quality and strength also continue to support the category.

On the other hand, China's consumer tissue market has seen remarkable growth in the past few years and is expected to record healthy gains in volume and value in the next five years. While the market already features high retail per capita consumption of facial tissue, retail per capita in other consumer tissue categories still leaves significant room for further organic growth. Thus, retail consumption of toilet paper remains at less than a half of the per capita in North America and Western Europe, and paper towels and paper tableware categories are even less developed. All in all, over 2018-2023, China is expected to add another two million plus tonnes in incremental retail sales of consumer tissue, or an estimated USD 6 billion. Importantly, as the country's unmet potential in consumer tissue is estimated at over four million tonnes, or USD 11 billion, there remains significant room for further organic industry growth in the country, well beyond 2023.

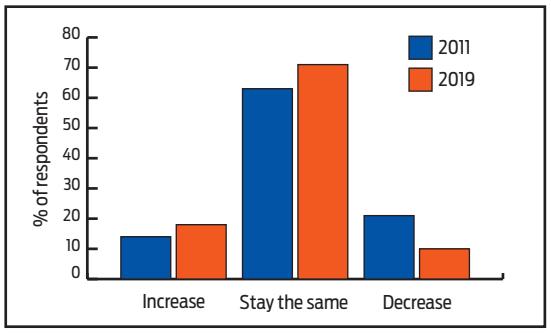
Higher purchasing power, coupled with rising modern hygiene and product awareness, afford Chinese consumers, especially those from rural areas, increased usage frequency of tissue products. While toilet paper still accounts for over half of total retail tissue volume in China, its relative share has been shrinking, as boxed facial tissues

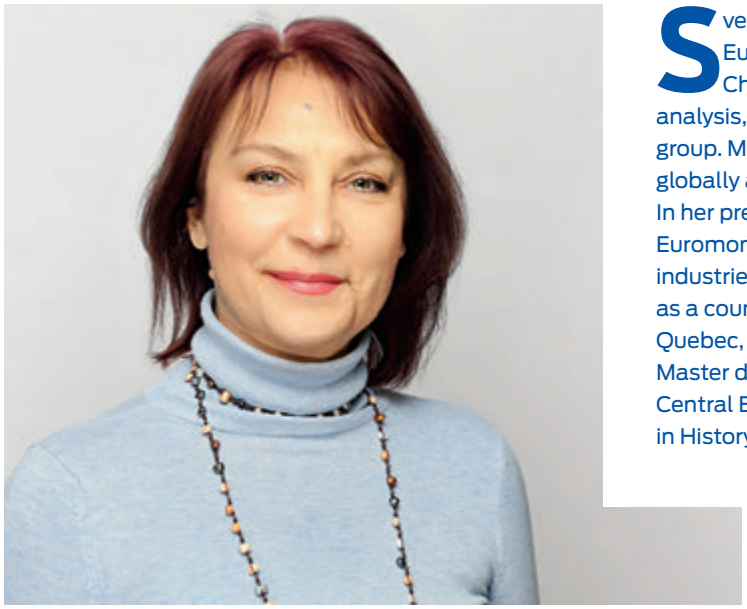
▶ US and China, kg per capita, retail tissue, 2018/2023. Source: Euromonitor International, a market research provider.



> China is expected to add another **two million plus tonnes** in incremental retail sales of consumer tissue

▶ Spending in the next 12 months, % of US respondents to increase/decrease spending on private label, 2019. Source: Euromonitor International Lifestyle Surveys, 2011 and 2019.





Svetlana Uduslivaia is a Head of Research at Euromonitor International. She is based in Euromonitor's Chicago office. In her role, Svetlana oversees research, strategic analysis, and client support within Home & Technology research group. Ms. Uduslivaia regularly speaks at key international events globally and works with the key global industry publications. In her previous roles with the company, Svetlana managed Euromonitor's research program in Canada across a number of industries. She started her career at Euromonitor in 2000 years as a country analyst for Canada and was located in Montreal, Quebec, then moved to Chicago office in 2009. She has a Master degree in Sociology from Lancaster University, UK, and Central European University (Hungary) and a Bachelor Degree in History from Moldova State University.

◀ Svetlana Uduslivaia, Head of Research, Home & Technology, Euromonitor International.

and paper towels have been gaining momentum. On the competitive side, private label accounts for a tiny portion of retail tissue sales in China, and the market remains open to value-added and premium innovation. Additionally, as online sales in China continue to see strong growth, new competition in the form of direct-to-consumer tissue brands is emerging across both value and premium segments. Surging online space also supports the survival and the evolution of a number of brands that face challenges from the new policies implemented in the country. Pressured by strict government policies on environmental protection, small mills and manufacturers that failed to reach national standards have been forced to shut down. However, a number of online players, notably Botare owned by Fujian Duoduoyun, not only survived but are in fact thriving, thanks to the rise of social commerce giant Pinduoduo and with the help of Lee & Man Paper's industrial clusters park in Jiangxi. Companies inside the park get paper from Lee & Man directly and then package and sell only a small number of SKUs. This business model allows the brands to radically reduce the cost as well as transportation time. Subsequently, the products are competitively priced without compromising much on quality, offer consumers a new value-for-money choice, and gain a substantial online presence in a rapidly growing digital retail. Euromonitor consumer lifestyle surveys indicated that while Chinese consumers do not necessarily place low price at the top of their priority list when it comes to shopping for household essentials, value-for-money is an important feature for nearly 39% of consumers, followed closely by high quality of products. Low price has been selected as an important feature by only 10% of respondents in China. By comparison, 43% of US respondents indicated low price as an important feature and 50% indicated value for money. As Chinese consumers evolve, get more familiar with products, get access to more brands and retail/pricing options, they will likely to rationalize their purchases more. Value-for-money, therefore, is likely to stay high and potentially increase further on the priority list for consumer shopping for household essentials. Hence, while China indeed offers a significant potential for long-term growth, it is crucial to understand the evolution of consumer needs and priorities as they get wider exposure for a variety of consumer tissue products and to respond accordingly when it comes to innovation, marketing, and retail strategies. ●

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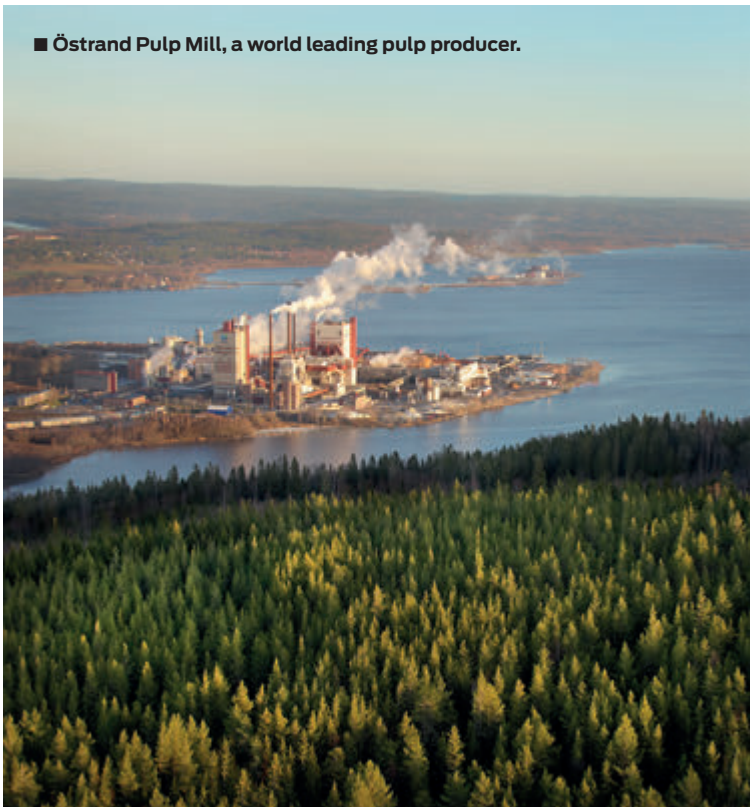
The completion of SCA's new state-of-the-art pulp mill, the world's largest production line for bleached softwood Kraft pulp, allows SCA to more than double the production capacity. A leap from 430,000 tonnes to an impressive 900,000 tonnes. The entire process is on a sustainable loop, enabling SCA to lower the mills low carbon footprint by another 50%.

by: TissueMAG

A pure commitment to the environment

▲ Jessica Sjöberg, Product Manager, SCA Pure: "SCA Pure is a pure commitment to the environment, and our customer's bottom line. Produced in energy-efficient processes that use resources wisely, and sourced from our own forests".



■ Östrand Pulp Mill, a world leading pulp producer.

"Our new premium NBSK pulp has outstanding properties. This vitally includes a highly robust tensile strength and not least -the best environmental profile on the market", says **Jessica Sjöberg**, Product Manager, SCA Pure. Jessica continues: "Naturally our new pulp complies with both FSC® (FSC C013162) and PEFC™ (PEFC/05-33-132). SCA Pure is available as both TCF and ECF, in a broad range to meet specific customer demands". SCA owns the largest private forest holdings in Europe, a well-managed, constantly growing asset in Northern Sweden, roughly the size of Belgium. For every tree harvested, SCA plants at least two new. "In fact, 43 million seedlings has been planted during the summer", it´s a truly circular process says Jessica.

Increased demand for certified premium pulp

"Today, consumers demand constantly improving pulp products, with reduced impact on the environment. In our vast, constantly growing forests we also care for biodiversity, 21% productive forest land is set aside for natural conservation", says **Henning Ellström**, VP of Sales and Marketing. Billions of people around the world can now afford to use fibre based tissue and hygiene products for the first time, and a rapidly ageing population in several large markets propels the demand for convenient hygiene products.
Add to that the huge need for the world to replace fossil-based materials such as plastic, where pulp will play an important role.

▲ Henning Ellström, VP of Sales and Marketing.

> “SCA is an **independent producer of premium pulp**, having produced pulp for almost 100 years”

▲ Henning Ellström, VP of Sales and Marketing: “Here, up north, in the cold climate of Northern Sweden, trees grow slowly resulting in strong and slender fibres ideal for making high-quality pulp”.

The result is increased demand for pulp. But not just for any pulp. The demand is for top class certified pulp. From trees harvested in carefully managed forests. Produced in energy-efficient processes that use resources wisely.

Consumers doubt us

Since climate issues are a hotter topic than ever. **SCA** wanted to know what consumers around the world really thought. What do consumers know about products made from trees? What do they know about fibre-based products and environmental certifications?
Do consumers perceive fibre-based products as recyclable?
Do consumers see the forest as a renewable resource?
“Therefore we conducted a global survey, covering all the major markets in Europe, US and China. The results of the survey were an eye-opener for us. We need to be better at communicating the strong environmental profile we have, not least how well we manage our forests. Environmental certification is not enough. 60% of the consumers believes that our forest is a scarce and decreasing resource. And they do not believe that our forests are managed sustainably”, explains Henning. “The result clearly shows that our industry has a challenge. We need to help each other to communicate that the forests in Europe are actually a growing, well-managed asset, especially in the Nordic region.
In Sweden, we have twice as much forest as one hundred years ago. And growing forests make an important contribution in absorbing carbon dioxide”, summarizes Henning. ●

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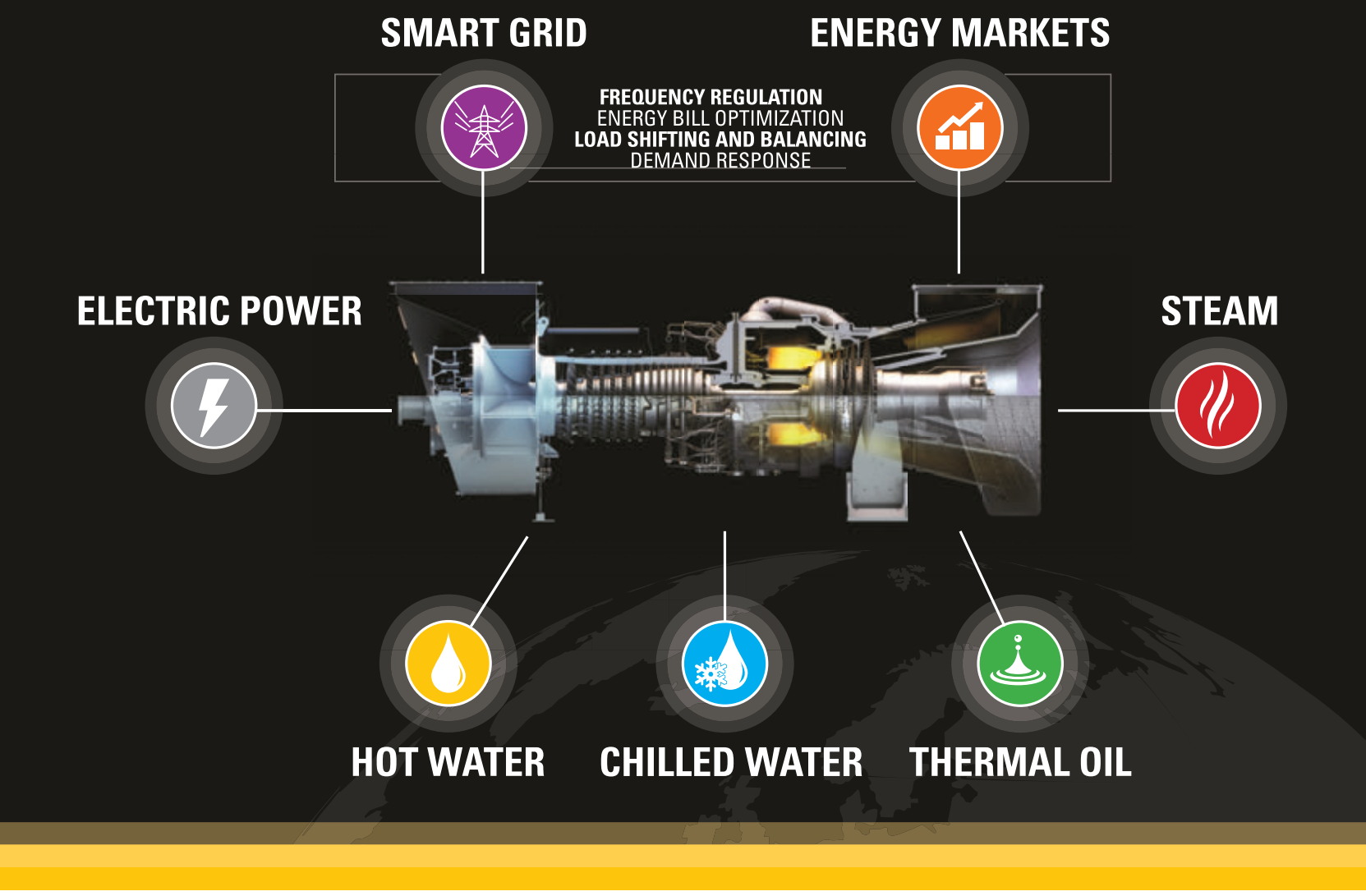

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TOSCOTEC strengthens its leadership of the Italian tissue market based on five-year results

Toscotec has strengthened its leadership position in the Italian tissue market, based on new machines installations in the last five years.

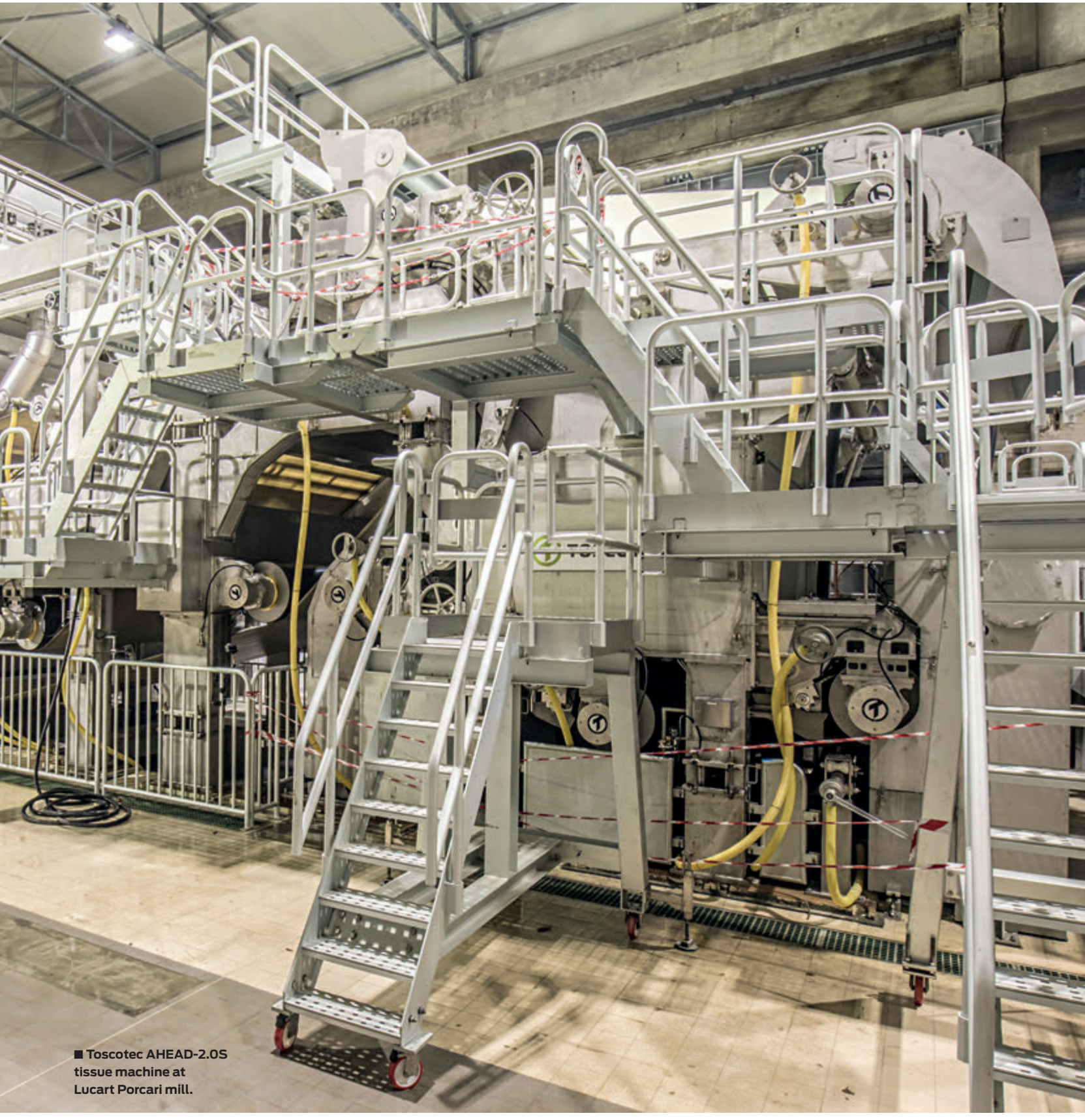
by: Toscotec SpA

New tissue machine installations in Italy

Since 2015, **Toscotec** has received five orders from Italian tissue producers for their paper mills located in Italy. They include two complete tissue lines for Eurovast's Cartiera della Basilica. One line replaced an older machine and is in operations since 2015 at its Bagni di Lucca mill. The other line has been installed at Eurovast Botticino mill and is currently scheduled to start production in the last quarter of 2019.

In 2017, a Toscotec-supplied tissue machine came online at a confidential paper mill in the South of Italy. In November 2018, Lucart fired up an AHEAD-2.0S tissue line at its Porcari mill.

This year, Toscotec received a major turnkey supply order from a



■ Toscotec AHEAD-2.0S tissue machine at Lucart Porcari mill.

confidential Italian tissue producer, who is scheduled to start up the new line in 2020. This new tissue machine will feature all of Toscotec's state-of-the-art technology, including TT NextPress, Toscotec's S-Crescent technology, a second-generation TT SYD and two newly designed slitter rewinders, featuring tension control and nip control systems. The project is on a turnkey basis and it comprises the entire tissue making line from the pulper conveyor belts to the rewinders.
This includes the machine's mist/dust removal systems and the rewinders' dust removal as well as the complete electrical system. There are several stages of energy recovery in the air system that will largely benefit the plant operations, including the hall ventilation and heating system. Toscotec's energy efficient technology has won over the Italian tissue market and raised the bar on performance and reliability, by introducing TT NextPress on Lucart's AHEAD-2.0S machine, which represents the first shoe press ever installed in Italy.

■ Aerial view of Sofidel America's Inola plant in Oklahoma, where Toscotec is supplying two tissue lines on a turnkey basis.

Cooperation with Italy-based International Groups

Apart from new installations in Italy, Toscotec also cooperates with international groups headquartered in Italy on a number of projects outside of the Italian territory. In 2018, it started a close cooperation with the Sofidel Group on their new Oklahoma plant, for the turnkey supply of two AHEAD-2.0L tissue lines currently undergoing installation. In 2017, Toscotec rebuilt on a turnkey basis PM10 of Lucart Laval sur Vologne mill in France, by modifying the wire and felt sections and supplying a new TT SYD and the steam & condensate system.

> "Toscotec's Tissue Division handles design and process engineering for **complete plants or individual plant** sections"

Foreign tissue manufacturers in Italy

The strong partnership between Toscotec and the German Wepa Group also led to two important rebuilding projects in Italy, at Wepa Lucca and Wepa Cassino mills. The former involved the rebuild into crescent former of an old machine, followed by a speed-up upgrade.The latter was carried out in three steps, from the rebuild into crescent former in 2009 to the supply of a new TT Headbox and TT SYD and the rebuild of the stock preparation system in 2015. The high degree of customization of Toscotec's tissue plants represents an invaluable source of success on the Italian as well as international markets. In recent years, Toscotec has made significant investments to equip itself with the most advanced engineering tools and to support the high level of specialization of its technical department, in order to respond to the market increasingly greater request for tailor-made plants. The fact that tissue producers such as Eurovast, Lucart and others have repeatedly selected Toscotec for the supply of their new tissue lines and rebuilds is proof that its technology is recognized as long established and extremely reliable by the Italian tissue market. Based on these results, Toscotec consolidated its position as market leader for the design and supply of tissue machinery in Italy. ●

■ Toscotec TT SYD.

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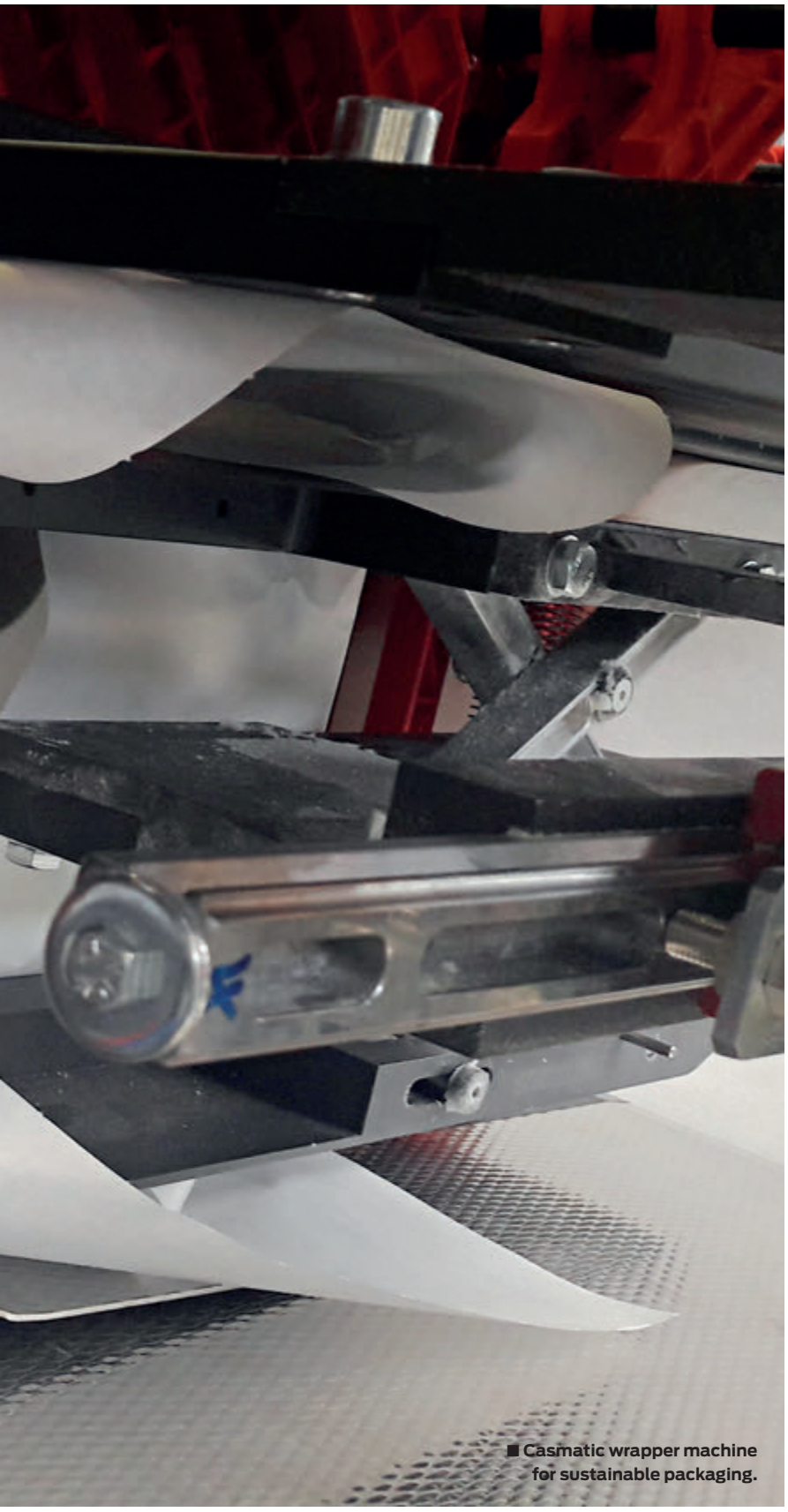
From plastic to paper and bioplastics: Fabio Perini and Casmatic make eco-friendly tissue products packaging conversion possible



■ Casmatic wrapper machine for sustainable packaging.

Replace plastic packaging with a new eco-friendly, combined paper and bio-plastic material on Casmatic packaging machines.

by: Fabio Perini SpA

Plastics are the most used materials in the world of packaging, but they need to be limited in light of recent restrictions of the European Commission concerning disposable products. In response, **Fabio Perini** has developed a "green" primary and secondary packaging solution that can easily adapt to current systems and existing equipment. This provides cost efficiencies for Fabio Perini customers and helps them actively contribute to safeguarding the environment while keeping up with technology and productivity. To accomplish this, Fabio Perini had to identify the most suitable alternative to plastic for primary packaging. This material had to be not only eco-sustainable, recyclable and/or compostable, but also as versatile as the polyethylene in terms of abundant availability, product protection, packaging options, printability, and resistance to production-related mechanical stress. Fabio Perini and a partner company conducted numerous materials tests on the latest generation packaging machines such as the CMW1000 and Carbon T, and ultimately developed an innovative, totally ecological material that combines paper and bioplastic to form properties that can be interchanged with normal polyethylene. The new Paper Packaging Solution addresses the facts that paper alone is not strong enough and water-repellent for primary packaging and that bioplastic alone is not economically viable for use on an industrial scale. Paper Packaging Solution is a paper coupled with Mater-Bi, a totally ecological bioplastic having the same properties as plastic polymers, but with the added benefits of being recyclable, biodegradable, and compostable. Two different types of Paper Packaging Solution products are available: a low-weight paper, 25 gm^2, and a thicker paper, 40 gm^2. Both are FSC-certified and are laminated or extruded

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▲Packaging made with paper and Mater-Bi.

with bioplastics with thicknesses ranging from 7 to 9 microns to ensure high pack weldability and an excellent product hygroscopic barrier. Further, Paper Packaging Solution products are available in virgin paper or recycled paper. The 100% biodegradable virgin paper is certified “Vinicotte OK compost,” which has the fibers closely joined to accommodate the higher heat needed for bioplastic fusion and perfect packaging seals, as well as being more resistant. The 100% recyclable and compostable paper has looser fibers. The heat passes through it more easily to create package seals, but the looser fibers affect its resistance. Paper Packaging Solution products are fully compatible with Casmatic’s latest generation packaging machines - such as Casmatic A6T, CMW1000 and the new Carbon T - thanks to the “bio-pack kit”. This innovative device makes it is possible to select the desired type of packaging material from the control panel and the Casmatic packaging machine automatically sets various parameters, including heat and time, required to perfectly seal the packages according to the packaging composition. These improvements have been implemented on the machines in order to allow working with any type of paper: virgin papers whose fibres are closely joined together, creating a barrier against heat that must be bypassed in order to melt the bioplastic to ensure proper sealing of the pack; recyclable papers, having wider fibres that allow heat to penetrate more easily, making sealing simpler. Casmatic machines today have the possibility to differentiate the various temperatures with related sealing times easily and automatically, thus guaranteeing workability with all products present on the market today. This is the Fabio Perini challenge: preparing its product portfolio and helping customers, with their current Casmatic brand machines, to actively contribute to safeguarding the environment with bio and recyclable products, simply by installing the “bio pack kit” that helps to keep abreast of technologies and productivity, respecting nature, the planet and the future. ●

▼Packaging made with paper and Mater-Bi.

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■ Sandreschi Paper Mill.

Over the years the product has changed following the evolution of the reference sectors and the international market. Moreover, as never before in this decade, there has been real awareness on the need for environmental respect and energy consumption optimization, both required throughout the entire production process. This has created the need to research in various fields, either for the transformation of production or for energy supply and water purification. The research, lasted years, allowed to achieve the perfect balance between the various elements in 2016. Regarding the product it is important

■ The care in the preparation of the finished product and the many years of experience in this field have allowed the Cartonificio a constant presence on the global market of the cardboard recycled in strips and reels.

If today a Start-Up has among its characteristics the ability to capture modernity without superstructures and relics of the past, if its winning cards are unconditional methods of analysis, the ability to understand what the market needs, and integrations with innovative processes, then the management team of Cartonificio Sandreschi is one effective representation.

by: Cartonificio Sandreschi srl

to emphatize that the production of Sandreschi cardboard is constantly optimized and tested thanks to the strong consumption of its reference paper district, which is one of the most important districts in the world. This also allows to make and always have available a wide range of gray and white gray boards, in various weights and types, for the custumers. The Technical staff of the Cartonificio responds to requests with flexibility and maximum availability. Going towards needs and rapidity in supplies is the flagship of the company. Unlike the inflexible relationship that one is obliged to have in the supplies for multinationals. Precisely to keep faith to maximum opening,

▶ Cartonificio Sandreschi closes the production cycle with low emissions using alternative energies by returning clean water.

> “Cartonificio Sandreschi has been working **since 1863** in the papermaking sector”

Cartonificio Sandreschi makes available to its customers, both domestic and foreign, a simple yet innovative tool: a graphical interface on its new website which, under the item “Service”, gives the possibility to directly order the desired product. Filling the fields of the available form as indicated, you can request the physical and chemical characteristics of the cards, divided into three families. The items listed in the data sheets have ranges that can be modified within certain values so the costumer can decide the values needed. After filling all the fields you just have to click “send the request” and, immediately, the Sandreschi staff will take note of the request and will reply indicating the further specifications, the necessary time for the shipment and everything else needed to bring the order to a successful conclusion. The **Sandreschi Cartonificio** is FSC certified to ensure the customers the choice of the company to marry and support the philosophy of environmental respect, social utility and sustainable economy. While creating its own product entirely from recycled material, the FSC certification was chosen for the following values: a challenge-oriented approach that the forests of the world and stakeholders have to face.
Since its foundation, 20 years ago, a certification system has been created to mobilize the strength of the market by offering the people a way to create a positive impact on forests and communities through their purchase decisions.
Thanks to the governance model, a global dialogue has been created to define a responsible forest management; this has led to large-scale changes in the field and positive results for forests and the people depending on them.
The Strategic Plan is a commitment to improve the FSC certification system and the specific strengths in new ways of accomplishing the mission.
It places emphasis on the growing number of FSC certifications in tropical countries, and gives voice to those who are most affected by the indiscriminate exploitation of forests - indigenous peoples, workers, communities, women and small owners - while responding to the needs of companies that already operate according to the Forest Stewardship Council standard. ●

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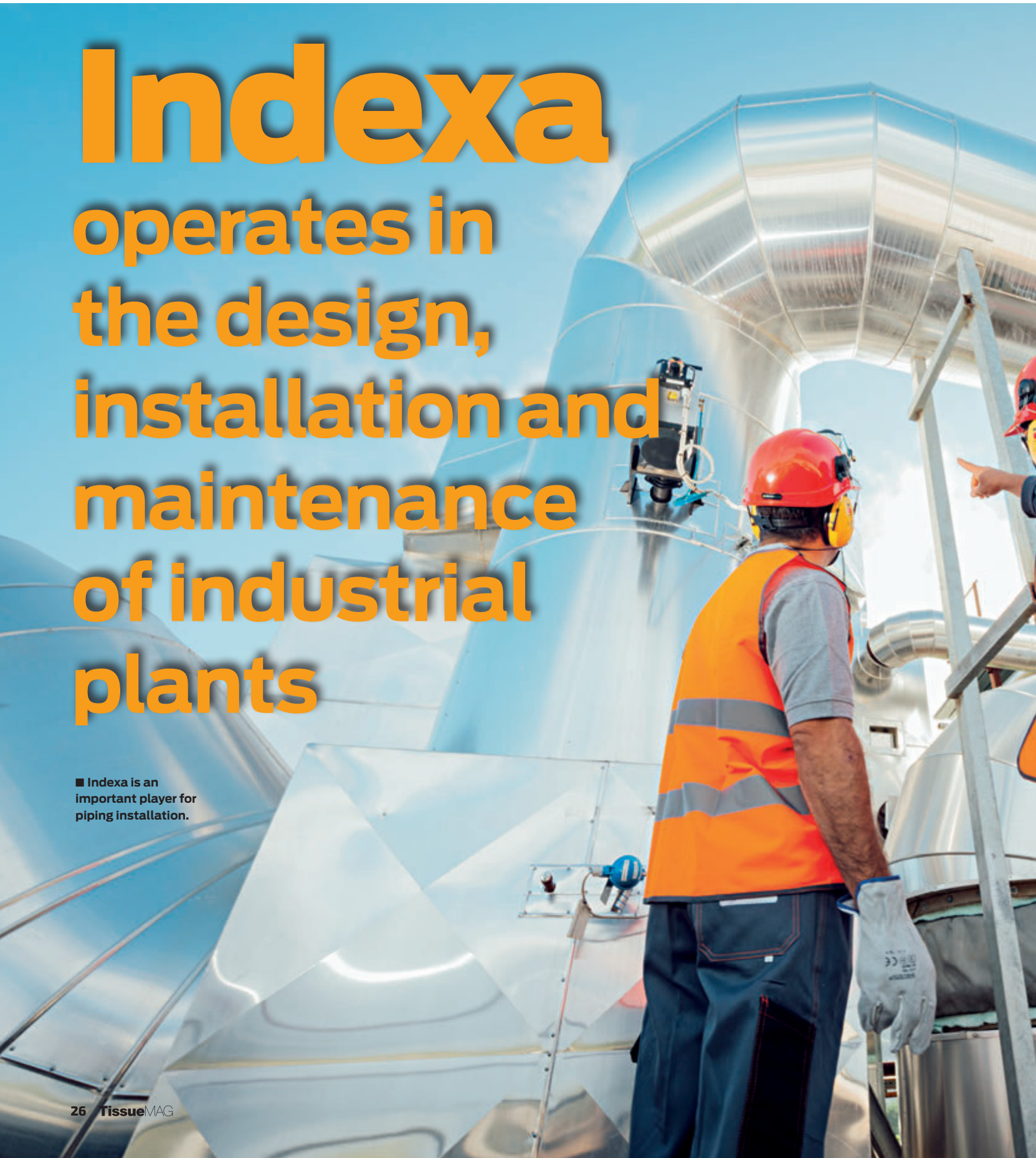
Indexa operates in the design, installation and maintenance of industrial plants



■ Indexa is an important player for piping installation.

The experience, competences and skills, consolidated in almost 30 years of presence in the market make INDEXA Company a reliable partner for most of Paper mills and Paper Machine Constructors.

by: Indexa Italia 2 Srl

The Company bases its strategy on long-term relationships with its customer, quickly responding to their technical and timing needs, offering best results in terms of efficiency maximization and short downtimes of production facilities.
Over the years, Indexa takes a comprehensive approach supporting numerous customers on their innovation projects (new investment or revamping projects) at national, European and international level, diversifying and tailoring its work.

The new direction of Indexa

Due to the high competitiveness of paper industry, Indexa focuses its efforts to optimize its performances, innovating its soft infrastructure towards a smart organization and, at the same time, extending its portfolio of services and its presence on the market.
The smart organization and the financial strength of Indexa allow to support customers with personalized projects in terms of technological and human resources taking into account the logistic requirements and local rules and standards. In this type of organization, each part of the company dynamically evolved according to the projects' needs and the customer is an active component of the entire process. The process is flexible, fast, and result-oriented in terms of effectiveness and efficiency.
The Indexa portfolio has been improved: the effort focuses on the Engineering services area. In the last year, Indexa has integrated in its staff important technicians with a long experience and technological expertise in the paper sector. The base and detailed engineering is added to Indexa's existing services, represented by:

- **Mechanical service**: "turnkey" assembling of complete, preassembled, self or third party construction machinery and plant;
- **Piping**: pre-fabrication of pipes and small pipes at the workshop or at the paper mill and piping installation (complete of related valves and instruments);
- **Electro Instrumental**: design, supply and assembling of MT/BT electrical plants. Equipment and automation plants;
- **Maintenance**: preventive, ordinary and emergency maintenance of machinery, plants and industrial services; maintenance engineering;
- **Carpentry**: realization of small, medium and heavy carpentry for structures and buildings.

■ Indexa's technical office operates on headquarters and on site.

During the last years, Indexa Company has faced a new challenge: to expand its presence in the evolving market. In 2019, it counts four business units:

- **Indexa Italia 2 Srl** (Fontana Liri, Italy), established in 1987, operates in the engineering, installation, revamping and transformation and maintenance of industrial plant;
- **Indexa Engineering General Contractor's Srl** (Fontana Liri, Italy) proposes itself as general contractor for the installation and maintenance of industrial plant;
- **INDEXA Poland Sp.zo.o.** (Bielsko Biała, Poland), was established with the aim of comparing, sharing and increasing business experiences and skills, in an emerging and demanding market;
- **INDEXA USA INC**, the new company founded in 2018, based in New York State and also registered in Oklahoma State with the aim to operate in the U.S. market.

> "Experience, strength, ability and smart organization are the **key elements** of Indexa"

Future Indexa projects

2018 was a very positive year for Indexa. Its constant determination and its attitude on handling multiple projects simultaneously found its realization in the affirmation of Indexa as an important player in the paper market for the installation and revamping projects. Indexa acquired important jobs, such as complete mechanical and piping activities of two Tissue Machines in Spain (one of them included also Electrical assembly); two complete mechanical, piping and electrical assembly of two board making lines in Italy; one important project as general contractor for security paper for passport and banknotes in Italy.

Indexa would like to confirm this trend in 2019. It has acquired one important project in Slovakia for the assembly of a board making line; another project in Italy for piping, tanks and electro-instrumental installation. In addition in U.S. it has acquired important projects for mechanical, piping and electrical assembly of two Tissue Machines and also for Converting lines. Experience, strength, ability and smart organization are the key success factors of Indexa Company, enabling to Handle Multiple Projects Simultaneously on engineering, installation and maintenance of industrial plants. ●

■ Indexa offers design, supply and assembling of MT/BT electrical plants, equipment and automation plants.

INDEXA ITALIA 2 SRL

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The potential of TISSUEHUB with AirMill & PatternLab

■ Gambini's TISSUEHUB & the full-size Pilot Line.

TISSUEHUB, Gambini's new Technology Development Center is now host to the first full-width 2.8 m (112") Pilot Line that's been operational since this past spring. TISSUEHUB is designed for sharing ideas, testing innovations and developing new solutions.

by: TissueMAG

After only a few months of its opening, concrete results have already been realized. **Gambini**'s Sales Director, Mr. Carlo Berti, and Technical Director Eng. Paolo Lazzareschi provide deeper insight into all the advantages of this innovative laboratory.

Carlo Berti tells us:

A year ago, we announced the opening of **TissueHub**, and it's now a well-established reality. Although we imagined the potential of this great technological laboratory, the numbers its generated are far beyond our original expectations, Numbers related to visits by existing and prospective customers who have come to test our new **AirMill** technology, and numbers of those who have tested new embossing solutions on the Pilot Line with the **PatternLab**'s support. Also, numbers related to orders & projects generated after trials with our technologies. Since this past April 1st, when TissueHub was officially opened, we have had over 15 customer trials and the projects created for the company are beyond our expectations. For sure, an investment that has immediately translated into many new opportunities.

What do customers who have chosen TissueHub have in common?

In my opinion, the common thread is the desire to explore and find new solutions in the context of an advancing technological innovation which allows the use of fewer resources and a reduced environmental impact while maintaining high-quality finished products. That is a key point for our customers. This is one of the main purposes of our Research & Development department that continues to explore new paths and which last year allowed us to launch AirMill to the marketplace.

Therefore, can we say that AirMill is the real protagonist of TissueHub?

The AirMill technology is certainly very much a main area of focus for our customers but it's not the only testing that our clients require at TissueHub. Customers also choose TissueHub to develop new patterns or improve existing ones. PatternLab, a section inside TissueHub, is dedicated to the development of embossing designs and is responsible for supporting customers in all parts concerning the development of new products. Sometimes the customer brings an idea to be processed and implemented by our

> "TISSUEHUB is designed for **developing** new solutions"

developers, while other times they rely on our PatternLab professionals to request the complete project from the embryonic idea stage to final pattern development. In both cases, the trials allow our customers to obtain all the technical information needed to make the right choices and obtain the best possible product to meet their needs without expecting surprises during production. That's why many customers rely on TissueHub. New products and patterns can be tested before having the machine installed. A guaranteed product that's ready to be launched on the market.

▲Mr. Carlo Berti, Gambini's Sales Director.

▼Eng. Paolo Lazzareschi, Gambini's Technical Director.

Mr. Lazzareschi, can you better explain how all this happens?

As Carlo has already explained, the TissueHub is chosen by customers with different needs who want to make trials with AirMill, and by those who want to develop new embossing patterns for new products or improve and enhance existing ones. The real revolution of the Development Center like ours is that tests are carried out on a complete full-width line at production speeds up to 550 m/min (1,805 fpm) and therefore the product obtained is fully reliable as it's tested at industrial speeds.
The same test performed on conventional pilot machines cannot give the same result due to the obvious differences in terms of paper width and the maximum achievable speed. Instead, in our TissueHub, the results of the testing corresponds perfectly to the production reality which allows having certain verifiable results, optimizing time and costs. Additionally, the 2.8 m (112") machine format allows customers to test up to 5 different patterns on the same embossed roll, at the same time.

Eng. Lazzareschi, how is AirMill behaving in these tests?

AirMill has confirmed everything stated to date: thickness and absorbency increase without losing any softness or tensile strength. The numerous tests we have carried out on paper of differing characteristics confirm the expected results, which in some cases have even been exceeded.
Sustainability is an equally important aspect as this technology requires the use of fewer resources for a result that can be even better if seen in the context of a cooperative effort between converting and the paper mill. In a few words, to get the tissue paper with the features that AirMill is able to achieve through its embossing process, it's usually necessary to spend high amounts for energy costs

■ PatternLab's innovative products.

in the paper mill. In the overall balance between the amount of energy spent in both processes, and in view of potentially lower use of fibers in the paper-making process; reduced use of chemicals and in the refining process, this technology greatly lowers the environmental impact.

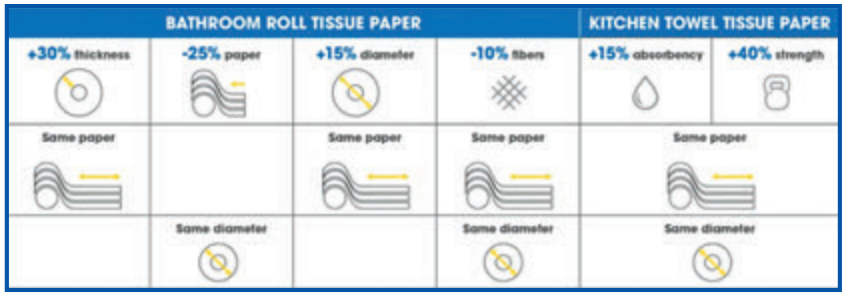
Mr. Berti, often happens that products that best protect the environment are considered of less quality and less attractive for the consumer. Is this the case?

Protecting the environment is an essential prerogative and AirMill brings advantages in this sense since it allows to obtain the same finished product while reducing the use of raw materials without changing the clients perception. The very same roll will contain less cellulose, therefore less felled trees, while still maintaining its volume, absorbency, softness, and tensile strength.

Mr. Berti, one last question, what else should we expect from Gambini?

It is important for us to continue innovating. We will do it again in the embossing and winding areas and in the cutting section as well; further stages of which we will talk to you in the near future. Meanwhile, we are preparing a big party to celebrate the 150th Anniversary of the Company, which began its activity back in 1870. At MIAC 2020 there will be a great surprise! ●

▼Key advantages.



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"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

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TP-StopLess.

The innovative NON STOP Reel Change method in Tissue Winders (Patent pending)

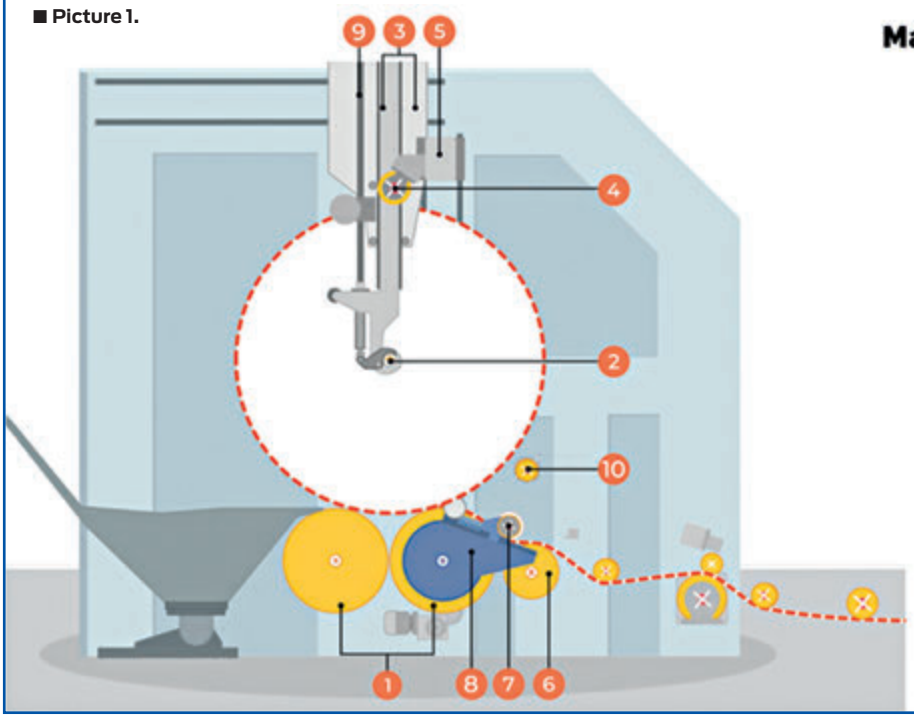
■ Tissue Winder, high performance version.

When winding tissue there are many factors that limit the winders operating speed. On "conventional" tissue products the main limiting factors are: paper width, number of plies, diameter of cores at wind-up, number of slitters into operation.

by: Mauro Della Santa, Sales Manager, Tecno Paper Srl

When talking about "Super Soft" tissue, whose reels (mother and finished ones) have a low density and the structure of the web is more sensitive to permanent deformation, to the above factors we have to add the high relieving actions on chucks and rider rolls, necessary to keep tissue properties, that reduce the reels stability at high speed. In order to keep high the productivity of tissue winders, enabling them to match the output of tissue machines, also in those cases where speed cannot be raised, **Tecno Paper** has developed, and patented, rewinding methods able to increase the operation efficiency significantly. We mean that for the productivity "speed is not all", but efficiency has a great impact. The most recently developed and patented method is the TP-StopLess, a Non Stop finished reels change system.
The main feature of this winding method is that the working speed is only slightly reduced and there is no intervention of the winder operator in the phase of reel exchange and evacuation from the winding position. From the points of view of the quality of the initial winding (keeping tissue properties) of the new reel and of the stability of both reels (newly forming and finished ones), the method allows the best conditions because both reels are constantly supported and in contact with the carrying drums; this allows the NIP against rolls and the entire winding operation are fully controlled from beginning to end, thus avoiding the bad situation that one of the two reels moves freely. Compared to a traditional winder for conventional tissue, the StopLess model has several additional elements, as evidenced in **picture 1**.

■ **Picture 1.**



Main components of the system

1. Carrying drums
2. Primary chucks
3. Primary chucks relieving system
4. Rider roll
5. Rider roll relieving system
6. Change roll
7. Secondary chucks positioner
8. Helper (pivoting system of change roll)
9. Finished reel removal system (positioner)
10. Core shaft

■ Tissue Winder with automatic finished reel change.

Main Features and Benefits offered by TP-StopLess system

- **Efficiency increase of the winder by 15% to 22%**, depending of several factors like: number of unwind stands in operation; diameter of parent reels; diameter of finished reels.
- **Very smooth finished reel removal** obtained by a dedicated device which gently pulls the reel off the carrying drums and positions it onto the lowering cradle, thus avoiding any deformation to the reel structure. This device has replaced the traditional hydraulic pusher.
- **High precision "Closed Loop" NIP** control of reels against all rolls during the entire winding operation (reel growth and finished reel change).
- **No free movement of reels** at any phase of winding operation.
- **Bulk and crepe loss reduced** at the minimum extent.
- **Control system and HMI** are very operator friendly.
- **Integration** with TP-Win 4.0 e TP-Service.

We see one additional roll (Change Roll) close to the rear carrying drum, a pivoting system for the new forming reel, additional chucks (Secondary Chucks) and a particular finished reel removal system (that is a positioner) in place of the traditional hydraulic pusher. For ease of explanation and clarity, the operating mode can be summarized in phases:

- When the winding reel approaches the final diameter, the speed slows down and the new core shaft, hold by secondary chucks, gets in contact with the change roll.
- Due to speed reduction of finished reel, a tissue sail is forming on rear carrying drum and it is brought back by air blows into between new core shaft and change roll.
- A new tissue reel starts formation and the removal system moves the finished reel onto the lowering cradle. Now the primary chucks are free and start descending to clamp the new forming reel that is being transferred from change roll to the winding position between the carrying drum.
- Rider roll is approaching the new forming reel, primary chucks have clamped the shaft of the new reel, secondary chucks retrieves to a waiting position to be loaded with a new core shaft and the cycle starts again. ●

▲ Tissue Winder with automatic web tension control at unwinder.

TECNO PAPER SRL

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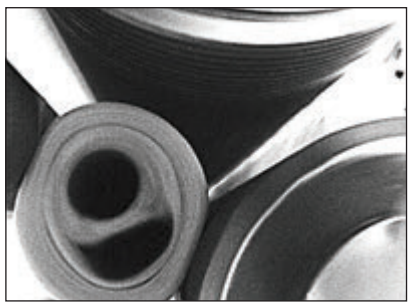
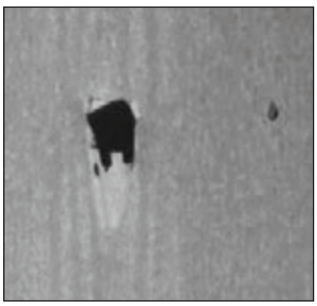
- *Detecting and documenting all web defects*
- *Quickly finding the root cause of process interruptions and web defects*
- *Evaluating embossing and print quality*

Dirt on the sheet captured by WebVision cameras could be the cause of a break further down the line.



Converting problems can be identified to avoid costly process interruptions.



Holes detected at the winder can be traced back to locate the root cause of the defect.

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■ **Material handling for any type of rack storage by means of roller track FIFO first-in/first-out or LIFO last-in/first-out.**

Managing complexity is in TecnoFerrari's DNA, as TecnoFerrari has 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. Focused on continuous research to improve the products and the functionality of the machine and starting from the know-how developed by the ceramic world, today we can boast a vast competence and flexibility in our approach to storage and logistics systems that has allowed us to create a position also in other sectors such as Tissue, Beverage, Automotive, Paper, Pharmaceutical/Medical, Food and many others. **TecnoFerrari** offers AGV vehicles provided with both magnet or laser guided technology for navigation and with latest safety and logic control systems, this representing the widest solutions portfolio available in the market. Industry 4.0 paradigms are implemented in all AGV systems and

TECNOFERRARI: innovation in automatic handling and storage systems

Over 3,500 AGV automatic guided vehicles installed worldwide.

by: Gruppo TecnoFerrari SpA

this allows the interconnection with all machineries and with the company ERP system. The supervisor software, a complete suite developed by Tecnoferrari offers the complete management of the production schedule and the possibility to customize it according to the Customer needs is an added value in terms of flexibility. TecnoFerrari AGV system allows a substantial cost saving if we compare the same activity carried on by manual vehicles. TecnoFerrari AGV allows to cut the loss of productivity due to the inefficiency of the manual transportation. Also the damage of the transported product handled manually it is substantially reduced by AGV with a smooth and constant working-flow. 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;
- Cost reduction;

◀ Handled material are loaded/de-loaded in any type racking structure: Conventional, Drive in, Live storage by means of roller track (FIFO first-in/first-out or LIFO last-in/first-out). Mobile structural compact pallet rack.

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

> We are **innovation** since 1966

- Ability to interface with other production technologies;
- Data protection and collection.

And also:

- Versatility of the system and limited workings for track extensions and modifications;
- Reliability and sturdiness of the vehicle.

Key of the success: customized and innovative solutions

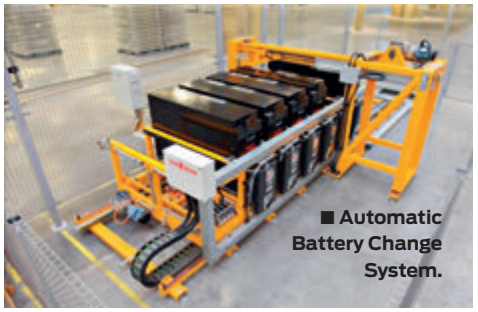
TecnoFerrari designs and implements its own system using latest generation tools. Machine concepts and development are obtained by modern CAD 3D software and products data and formulas are elaborated by a PDM system. The engineering staff is able to manage even complex processes and plants layouts providing Customers with optimized solutions in terms of performance, reliability and flexibility.

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 a few minutes. There also exist models 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 batteries, without operator intervention. It 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.



■ Automatic Battery Change System.

Safety

The vehicle has a sophisticated and reliable active and passive system 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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SULZER focuses on development partnerships and pumps as smart data collectors

Last year, some 15,550 employees generated sales of around 3.4 billion Swiss francs. The global network includes 180 sites for development, production, sales and service. The pulp, paper and board industry, along with energy, water, food, biofuels, metal and mining industries, is of key significance to the company. "The pulp and paperboard industry is one of our key markets as a supplier of a complete product range. The processes and applications in these industries, as well as the development of new wood-based raw materials have a high priority within our R&D department. We are also committed to form new partnerships. This strategic, dedicated and long-term cooperation at pilot and demo sites is crucial for capitalizing on the fascinating future potential of this industry", explained **Veli-Pekka Tiittanen**, Head of Industry Business Unit at Sulzer.

> "**Innovation** and **Research & Development** play a pivotal role in the sustained success of Sulzer"

Competence center in Kotka

The **Sulzer** competence center in Kotka, Finland, is the world's largest test loop research facility for the pulp and paper industry, and for new process applications based on wood as a raw material. Pumping and mixing technologies can be tested on an industrial scale. The test cycles are suitable for different liquids and can handle fiber suspensions that have a consistency of up to 20 percent. The system is designed for the study of pumping, agitation and mixing processes and is available for demo runs and tests, conducted with absolute confidentiality.
In Sulzer's view, even closer and more active collaboration between manufacturers, machine builders, engineering companies and scientific institutes is crucial to seizing the opportunities that the wood-based industry will open in the future. The increase in pulp demand continues strongly for board and tissue as well as for other hygienic products and will accelerate for textiles. Forest companies, research institutes and other industry partners are actively investigating and developing new processes for additional higher-value wood raw material-based products. Such developments are, for example, replacing cotton and oil-based synthetic fibers like polyester, or producing higher-value carbon products and modified cellulose materials for packaging barriers, coatings for medicines and nutrients.

Intelligent solutions

The innovation power of Sulzer is based on knowledge and expertise gained over decades. The AHLSTAR series of process pumps is particularly efficient, suitable for use with substances in large

■ The AHLSTAR pump range has proven performance for widest application range in the pulp, board and paper industry.

Sulzer has a long tradition as a supplier to the pulp, paper and board industry. The company, with head office in Winterthur, Switzerland, is a committed development partner to the industry, focusing on both new production processes for wood fiber-based products, and the use of digital technologies.

by: Sulzer Pumps Finland Oy

▲MCE™ medium consistency pumping systems for fiber suspensions up to 18% dry solid content.

▼Full scale research and development center as a key for new innovations.

volumes, including various types of suspensions even with a high proportion of air or gas.
Many of Sulzer's products are tailored to specific process applications. MC medium-consistency pumping systems combine high performance with energy-saving capabilities and are used in pulp mills with the world's highest production rates. The SALOMIX horizontal agitators and Scaba vertical agitators offer optimum results in mixing applications with liquid and pulp tanks or towers, while the TMS tower management system prevents channel formation in pulp storage towers offering important process advantages.
The double suction axially split pumps ZPP and Z22 are specially designed for use in paper and board machines' head box feed, and the multi-stage MBN pumps cover a wide range of high pressure and shower water applications.
Sulzer HST turbo compressors, aerators and submersible pumps and mixers are important products for industrial water treatment processes.

Digital technologies

According to Sulzer, it is now possible - and affordable - to turn pumps into smart, interconnected devices. The company recently launched Sulzer Sense, a smart wireless condition monitoring solution that can be attached to all kind of rotating equipment. The system is designed to measure temperature and vibration.
The data is sent to the cloud and can be monitored in Sulzer's online service on a mobile, tablet or laptop anywhere and anytime.
The solution supports predictive maintenance and helps to avoid sudden pump failure and eventual downtime. No manual measurement is required, and this saves time and improves safety at the site.
Sulzer aims to deliver its new process pumps with the integrated sensor. The company continues to develop further predictive maintenance algorithms, machine learning and smart asset management functionalities to maximize the added value for the customers. ●

Boiler plate

Sulzer's core strengths are flow control and applicators. The company is specialized in pumping solutions and services for rotating equipment, as well as separation, mixing and application technology. Sulzer provides cutting-edge maintenance and repair solutions for turbines, compressors, pumps, motors and generators dedicated to increasing customers' life-cycle cost effectiveness.
Sulzer is a service specialist that is renowned for its technology-based solutions, fast execution and its expertise in complex maintenance projects. With a network of over 100 service sites around the world, it is at the customers' doorstep. Sulzer has been headquartered in Winterthur, Switzerland, since 1834. In 2018, the company achieved sales of roughly CHF 3.4 billion with around 15,500 employees. The shares are traded on the SIX Swiss Exchange (SIX: SUN).

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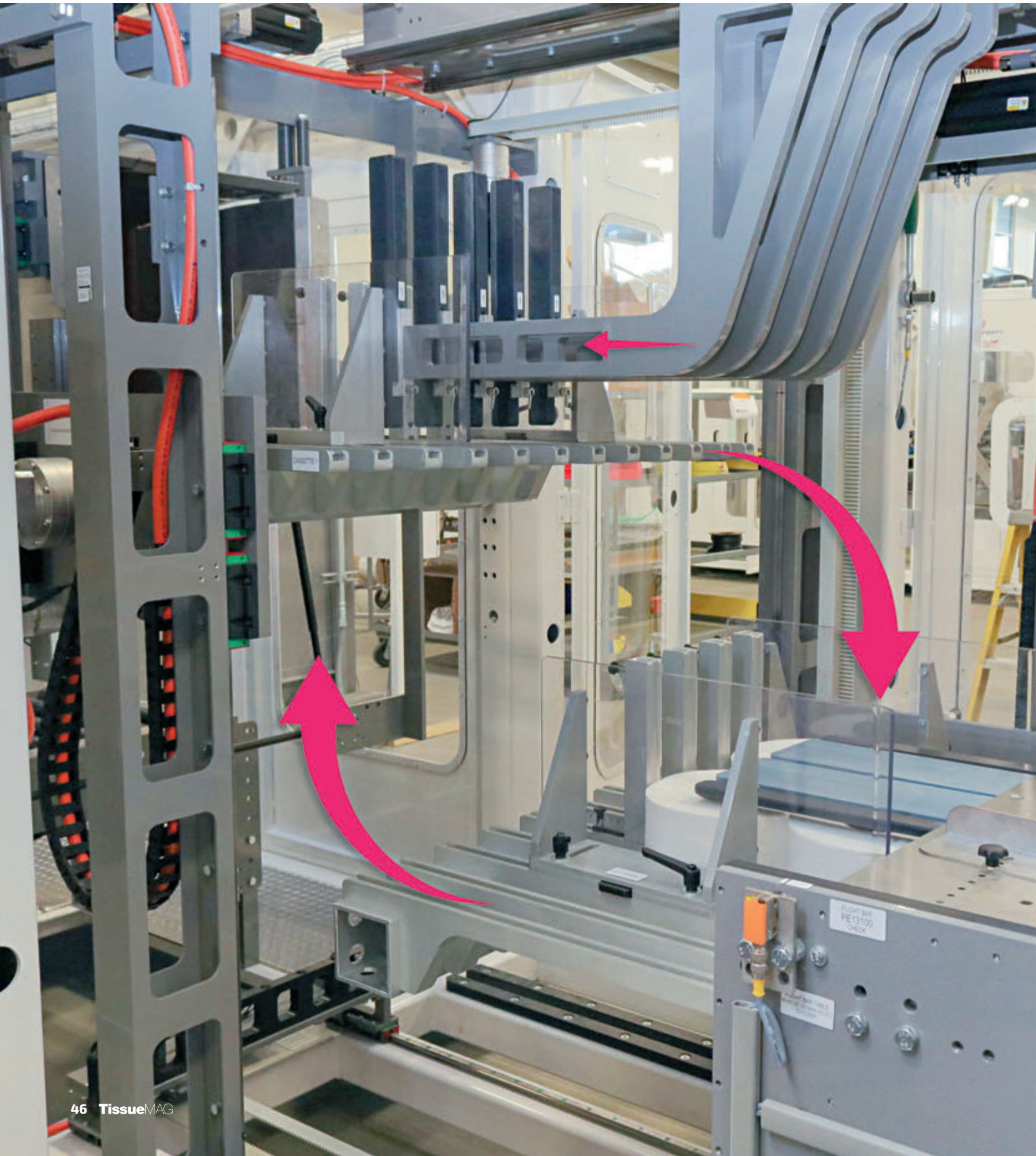

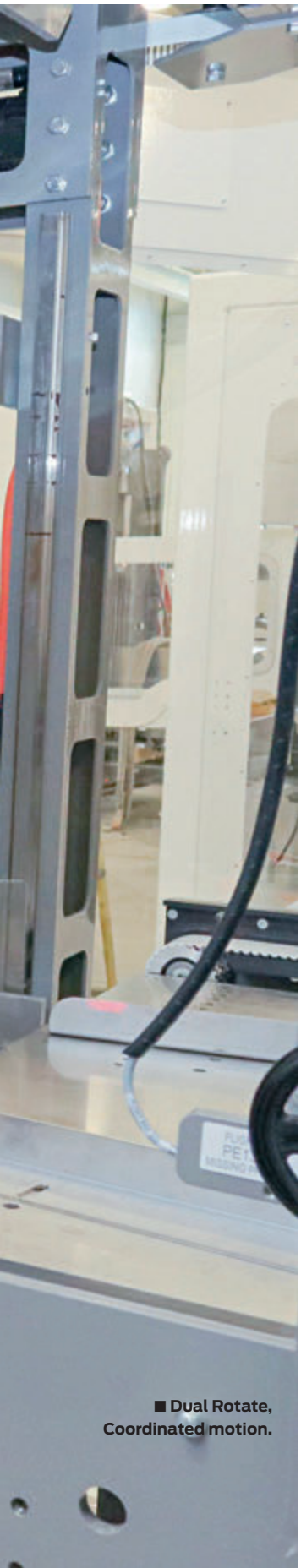

■ Dual Rotate, Coordinated motion.

Infinity to offer full line of Casepackers in Siemens platform

The Infinity line of casepackers have become an industry standard when it comes to tissue and hygiene product casepacking. Infinity casepackers have been specifically designed for tissue rolls/packs, boxed product, folded products and industrial rolls. However, for many years, Infinity casepackers have only been offered in the Rockwell platform, but that is about to change. by: Infinity Machine and Engineering Corp.

Infinity offers three models of casepackers, the SLF (side load), the C10 (capable of 10 CPM), and the C15 (capable of 15 CPM). All three models are designed to automatically erect a case or tray, collate the incoming product, fill the case or tray, and discharge it onto a live roller conveyor. The advantages of an Infinity casepacker start with its simple and modular design. The C10 and C15 models have an integrated servo diverting system coupled with a dual servo flight bar system. The SLF has a pneumatic pusher arm which loads the product into the cassette. These designs ensure repeatable change-overs, ease of operation, high production efficiency, and low maintenance. The advantages of Infinity's line

“The **perfect integration** of performance and flexibility”

▲Drone shot of Dual Rotating Cassette Casepacker.

of casepackers continue with their overall accessibility and small footprints. An operator can quickly access all sections of the machine and many times, is able to perform a product change-over in a matter of minutes. Lastly, by using a minimum of moving parts, an Infinity casepacker is more than capable of running 24/7. The first Infinity casepacker is still in production, 16 years later.

For all these technical reasons, market demands and customers requests, **Infinity** is now excited to offer their full line of casepacker in Siemens. Starting in spring of 2019 Infinity began working with Siemens to convert all casepacker programs to the TIA portal and by the end of 2019 Infinity will be ready to offer a full line of Siemens casepackers to tissue producers world-wide. Infinity has also been cross training programmers and enginering to support new Siemens machines in the field. This is just the first step in offering Infinity's patented Infusion casepacker/bundler/bagger modular system to tissue producers across the world in a new electrical platform. The modular system is the best option for tissue producers to keep up with changing market demands. However, the news does not stop with development of a casepacker in Siemens. Infinity has also been busy in 2019 coming up with new casepacker designs. For example, Infinity now offers a dual rotating cassette casepacker, which is perfect for higher-speed industrial and facial tissue lines. The new design offers many benefits. These benefits included 25% to 50% faster speeds on two- and three-layer formats. In addition, the new design allows for better control of the product during rotation, simplified programming and a servo controlled back-stop for non-rotate configurations. This machine is also modular which means producers can easily switch to bagging and bundling depending on their orders. The dual rotating machine is available for viewing on YouTube. In addition, Infinity has also developed a dual infeed side load casepacker which is a great fit for napkin lines with two wrappers.

Whether it is expanding Infinity's casepacker offerings in the Siemens platform, designing a new casepacker or bringing the modular system to different areas of the world, Infinity is ready for whatever challenge customers send their way. ●

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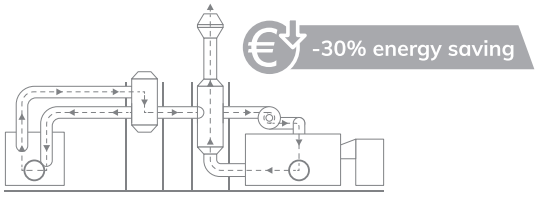

Introducing **Reenergy+**, a brand new autonomously-controlled integrated production model tailored to the demands of industry.

The culmination of three decades of experience in plant design and manufacture by EIL, **Reenergy+** is a revolutionary automatic system which delivers unprecedented energy savings through its hood-integrated gas turbine layout. Certified results include:

-80% toxic gas emissions
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Reenergy+. Redefining the boundaries of production to develop new standards of efficiency and sustainability.

EIL
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90 years of technology and Italian style

Despite the constant and continuous growth from the technological point of view, both at product and process level, Mingazzini has never lost sight of its original purpose: in-depth analysis of customer needs, customized responses and utmost attention to detail.

by: Mingazzini Srl

■ Steam boiler mod. PB 200, steam output 20,000 kg/h.

All this as an expression of the culture, flexibility and creativity that have made the "Made in Italy" famous and appreciated worldwide. Like a tailored suit, each plant is carefully designed and tailored with expertise and experience.

An exclusively family-owned business since the beginning in 1929, Mingazzini still keeps unchanged its brand pride and its values, handed down for four generations. These values, in perfect combination with the technological upgrading and innovation, over time have created a modern company that continues to pay close attention to the customer: not only in terms of the highest quality of the product, but also for an excellent level of pre- and after-sales service. All this in order to create a concrete proactive and one-to-one relationship of cooperation with the customer.

▲ Turn-key boiler room, composed of n. 6 steam boilers mod. PB 200, equipped with energy recovery system, steam output of each boiler: 20,000 kg/h.

In the year in which it celebrates its 90th anniversary, **Mingazzini** presents its latest generation of steam boilers, which meet the most demanding challenges of the near future. These boilers represent, in short, systems that are increasingly performing from the point of view of energy saving and respect for the environment. The quality and reliability of Mingazzini boilers are already widely recognized on the market and remain unchanged. In fact the design and construction of the boilers of the PB and PVR series guarantee first and foremost the maximum reliability over time. Starting from this certainty, Mingazzinl's R&D department has developed "ARS - Advanced Recovery System": an exclusive energy recovery system which is flexible and tailored to the specific needs of each individual customer and industry. With specific reference to the paper industry, Mingazzini acquired, directly on the field, a deep knowledge concerning the special needs of customers of different sizes, becoming a market leader capable of offering a complete service to the client, also providing innovative solutions and aiming at specific needs in order to optimize investments in plants and energy saving. The R&D activity is constantly focused on the introduction of new and more efficient solutions for the best management of thermal power plants of any size, even with boilers configured for operation without continuous supervision for 24-72 hours and all this with the availability of remote supervision and management of whole systems. Going into the details of energy saving, all the Mingazzini steam boilers of the PB and PVR series provide a standard efficiency of 90%. Depending on the number of working hours and the type of fuel used, they can then be equipped

▲ Turn-key boiler room, composed of n. 3 steam boilers mod. PB 120, equipped with energy recovery system, steam output of each boiler: 12,000 kg/h.

▲ Turn-key boiler room, composed of n. 3 steam boilers mod. PB 120, equipped with energy recovery system, steam output of each boiler: 12,000 kg/h.

▲ Steam boiler mod. PB 70, complete with economizer, steam output 7,000 kg/h.

with additional "standard" energy recovery systems thought for the single unit, capable of obtaining efficiencies up to 97.5%. Finally, even a greater efficiency, up to 99%, can be obtained with tailor-made energy recovery systems ("ARS" systems) which, pushing the condensation of the boiler smokes to the extreme, recover the latent heat as much as possible (obviously in addition to the sensible one). Another primary dimension in which a significant improvement in the performance of the last generation of Mingazzini boilers has been achieved is that relating to the progressive reduction of emissions into the atmosphere, through the use of the most innovative combustion systems. Thanks to the combination of the new "Low NOx"

> "**Tradition** is a fundamental aspect of our way of perceiving our activity and presenting ourselves to the market"

burners to the large combustion chambers that characterize the Mingazzini boilers, it is possible to obtain NOx and CO_2 values that respect the most restrictive local and international emissions standards. The commitment of Mingazzini for the future, even for the next 90 years, however, remains the same: increase customer confidence in their products, using the best technological solutions and ensuring safety, quality, reliability and service according to the "Mingazzini standard". ●

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A.Celli Paper: state-of-the-art turnkey solutions

A.Celli Paper, the Group's division dedicated to the tissue and paper market, has always adopted a strategy based on forming long-term partnerships.

by: A.Celli Paper SpA

■ A.CELLI Tissue Machine iDEAL.

A.Celli Paper is proud to offer an extensive range of products and advanced solutions for complete turnkey plants, the manufacturing and rebuilding of tissue paper machines and of rewinders for tissue, paper and cardboard, and machinery for handling and packaging of the finished product. This is all made possible with ongoing research and development and the use of high-end digital systems in continuous evolution.

A.Celli Paper can handle every aspect of setting up a complete plant: from the engineering to the supply of machines and equipment, as well as assistance with assembly and commissioning of the machinery, and training of the customer's staff, offering the benefit of its know-how. The company motto, "*one source, one responsibility*", expresses the willingness of A.Celli Paper to work with the customer and undertake to design and supply everything necessary, providing an absolute guarantee. The company's core business, the design and building of turnkey plants, is divided into six main sections:

1. **Engineering & Process** - personalised design of plants and machinery, with a focus on energy savings and efficiency.
2. **iDEAL® Tissue Machines** - developed with the most advanced technologies and managed by intelligent software, they guarantee maximum performance and can be adapted to the customer's specific needs. The range of iDEAL® models supports speeds up to 2,000 m/min, web width from 2,850 mm to 5,600 mm and reference production up to 260 t/d, using virgin fibre, recycled paper and bamboo. A.Celli tissue machines are based on crescent former technology and feature a headbox of exclusive design. The X-Roll® system, another company patent, is energy efficient and can increase dryness after the pressing phase, preserving the bulk of the paper: an alternative to the classic shoe press, simpler in terms of both installation and maintenance. The A.Celli FORGED YD® Yankee, an exclusive A.Celli patent, is seamless and with bolted heads and has a structure made with a single piece of steel which ensures greater resistance over time and less maintenance. The shell has internal grooves of innovative design that allow for better heat exchange and, therefore, reduced consumption. The final part of the A.Celli tissue machine is the pope reel with center winder technology, which maintains the tension of the web to improve winding and increase the overall efficiency of the machine.

> "In the **global paper and nonwovens markets** with top-range technological solutions for over 75 years"

■ Extreme Automation, Industry 4.0.

▲ A.CELLI Tissue Rewinder.

▼ A.CELLI R-WAY - Automatic Warehouse.

> “Excellent **technical assistance** and **services** for the maintenance and improvement of machinery everywhere in the world”

3. **E-WIND® Tissue & Paper Rewinder** - a range of rewinding machines for tissue paper and structured paper, with an innovative design and a medium to high reference production, designed and built for high speeds and superior performance to maintain the high quality of the final product. They can be equipped with a Slittomatic® cutting system and controlled by new generation software that offers high levels of integration, tracking and digitisation, guaranteeing maximum performance and safety.

4. **R-WAY® Integrated Solutions** - integrated end-of-line solutions, able to manage and optimise the Roll Handling & Packaging processes, from preparation to storage, up to the shipment of goods. The R-WAY® also includes the phases of palletising, packaging and weighing, and even handling of the finished reels using AGVs - automatic guided vehicles. The R-WAY® system offers extremely advantageous solutions for the management of automated warehouses which, today, are dynamic and intelligent environments, where there is room for robotics and information technology.

5. **Extreme Automation® - Digital solutions** is a business unit of the A.Celli Group entirely dedicated to the development of software solutions for machine data management, analysis and control, from the perspective of Industry 4.0. Machine Learning technologies have been implemented as part of the projects developed by Extreme Automation, which include an advanced DCS of innovative design, for predictive maintenance and optimisation of the working parameters of the machinery. The new “smart” machines are able to monitor, analyse, store and process data, providing optimal solutions aimed at improving product quality and the production cycle, while reducing downtime, human error and consumption.

6. **2-CARE® - A.Celli Paper’s customer service** is an important, helpful, skilled and efficient department in continuous evolution. It is dedicated to offering its customers and its business partners prompt assistance and collaboration over the long term. The Customer Care department handles the upgrading and retrofitting activities of tissue machines, winder and slitter rewinders both for tissue and for paper, as well as after-sales assistance and the supply of spare parts.

A.Celli Group, firmly established on the social media, has recently revamped its website and now it presents the new “From machines to words: A.Celli’s blog”, a blog about technologies and topics of interest that allows the user to keep interactively abreast of the latest developments in the entire sector of hygienic products. ●

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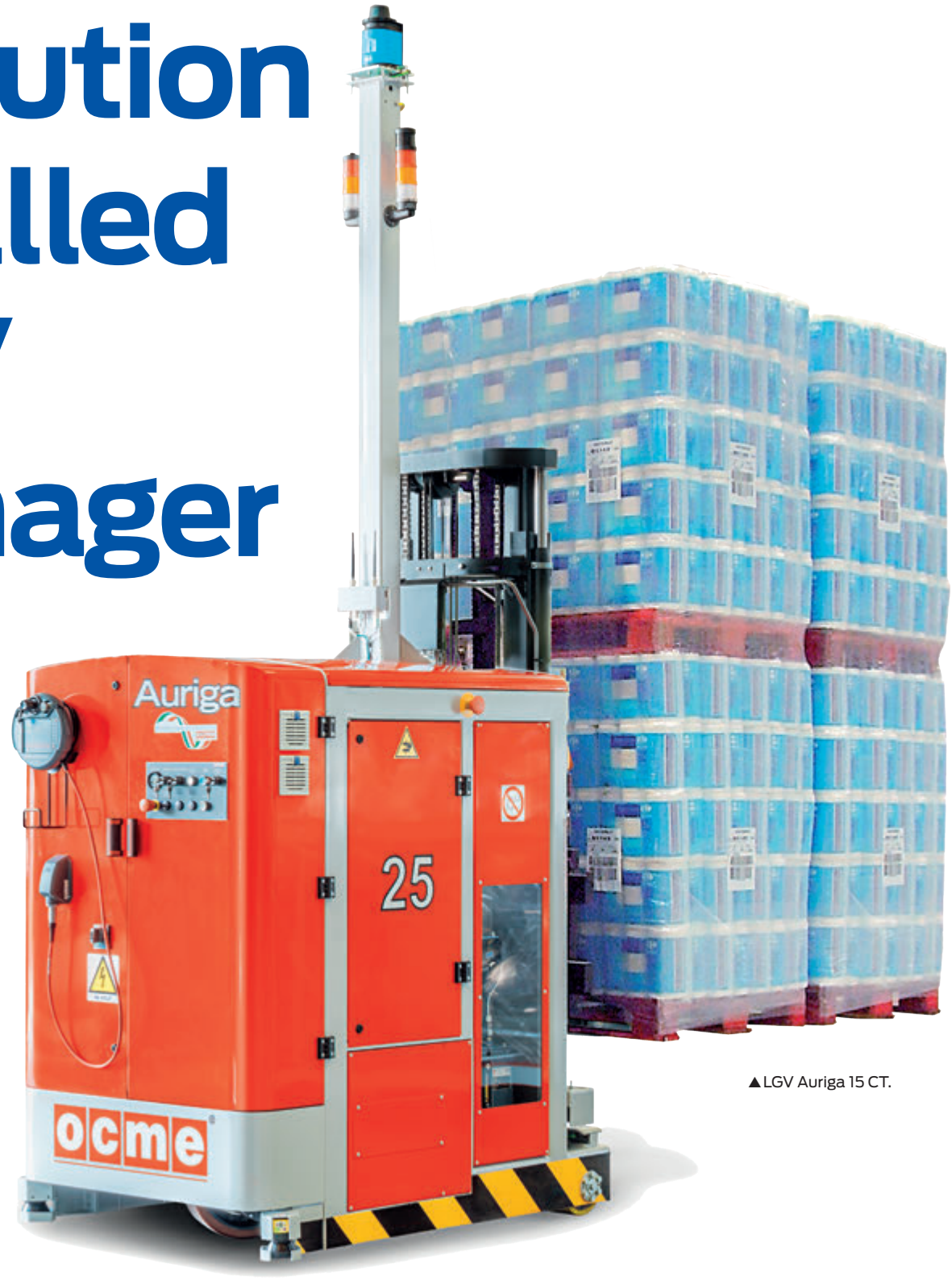
OCME: evolution is called AGV Manager 4.0



▲LGV Auriga 15 CT.

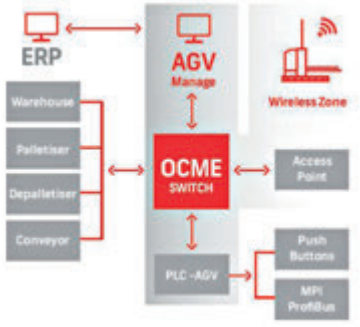
More than 60 years of experience in design and production of packing machines, high professionalism consolidated by more than 10,000 machines installed worldwide, great attention to research to offer not just products but solutions capable of answering and even anticipating the needs of the market: these are the premises of OCME, company established in Parma that together with Robopac confirms itself among the leading companies in the packing sector, movements and logistics.

by: OCME Srl

OCME that made innovation as one of its missions, promptly dealt with the evolution of 4.0 industry, giving an efficient and ahead of time system. AGV Manager 4.0 is, in fact, the new tool to supervise and control traffic to give moving and logistics solutions that can create "smart factories" totally connected and flexible, with a high level of efficiency and a total automatization of the movements control, granting perfect traceability of all data during each phase of the process.

AGV Manager 4.0 offers many advantages

Multiplatform access: access to functions of the system takes place through Web client (browser), making it independent from hardware and the system used by users.
Centralized distribution: the application is on the server therefore distribution and updates done on the server is automatically available for all clients.
Context of execution: a Web-based system can be executed in an Internet or Intranet environment.
Responsive web design: with responsive technology, graphics and structure (layout) of a web page, it adapts on every screen with best visualization in each resolution.
Mobility: access to data, information and system functionality, it can take place in every place and from each position.
Scalability: system dimensioning, in terms of users number, can be easily adapted to evolutions, either growth or rescaling.
Software personalization: though access control it is possible to personalize the software in a quicker and more effective way.
Traceability: data connected to moved loads are registered in a way to track the load in each path taken and where it is in the plant in each moment.
Cloud: production data is archived in the cloud where it can be consulted by the customer that requests it.
Analytics: based on the archived data, AGV Manager 4.0 does a prediction of the faults and proactive maintenance.



■ **AGV Manager.**

"OCME operates globally, providing customers with **premium, innovation-based solutions** for packaging consumer goods"

ROBOPAC
Innovation driven by values

◀ LGV Auriga RT H.

Architechture of the AGV Manager 4.0 is composed of four software modules

AGV Manager Service: this software controls the level of work of each LGV vehicle in the plant. Access to the service functions is done through Web Client. In this way all browsers connected to the AGV Manager 4.0 have the possibility to visualize the plant sinoptics, the list of missions operating, etc.

Traffic Manager Service: this is the software that controls the traffic of LGVs. The TM uses routing algorithms to calculate the best path that compromises the shortest way and traffic found.

PLC Manager Service: this is the software that reads field data and it is the mediator between the AGV Manager and the material part of the system.

> “OCME’s **mission** is to be a company where and with whom it is **easy to work**”

AGV Statistics Service: this is the software that collects data of the system, handles database and log collection for activities done by the system. Access to functions of the service through Web Client. Here below many of the functions offered by the software service: exaustive representation of statistical data in direct visualisation and on reports generated in PDF, CSV etc; possibility to have data on efficiency and production of LGV system. It can verify the number of missions for each LGV and in each area of the plant, showing strength and weaknesses of the plant; traceability of production data; monitoring and registration of activities done by users; alarms history and at least possibility to predict faults and predictive maintenance.

AGV Manager 4.0 system is an important upgrade that allows companies to optimise productive processes in terms of time and resources. It can be applied to the whole LGV range, including the last developed Auriga 14RT-H (Reach Truck-high), the retractable cart that can work inside narrow lanes and in height. 4.0 evolution is part of the developing project that **OCME** is involved in, including the next launch of the Auriga 30CT-ATL (Automatic Truck Loading), the LGV vehicle to automatically load trucks. ●

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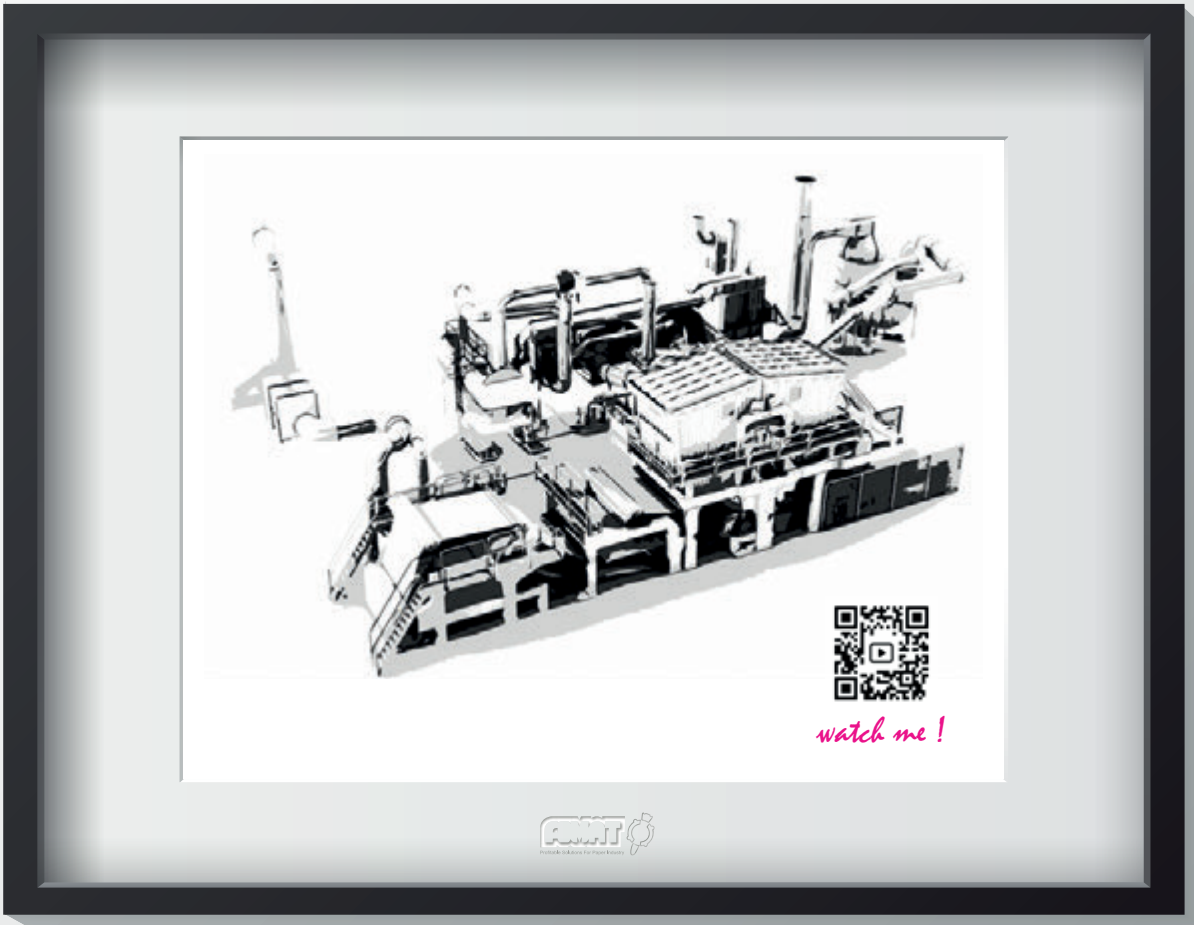

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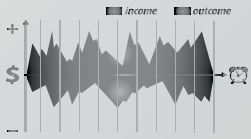

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Tissue Softness Analyzer

User Report ANDRITZ AG

Until 15 years ago, the hand-feel of tissue could only be measured manually. The procedure was time consuming and the results were unreliable and subjective.

by: emtec Electronic GmbH

■ **ANDRITZ - emtec. Klaus Gissing, ANDRITZ.**

We spoke to **Klaus Gissing**, Director *Prime*LineTIAC and Air & Energy Systems at ANDRITZ about the tissue trials and the use of the emtec Tissue Softness Analyzer: "The tissue market has turned more and more into a mass-production business since 2008. To stay competitive in the pulp and paper industry also in the future, we have to be better prepared in the premium segment. Customer do not invest in a machine without having seen it before. Therefore, ANDRITZ built a pilot tissue plant in 2017, which helps to improve and optimize existing processes and to find ideas for new solutions. In the focus are resource savings, increase in quality as well as sustainability. At our so called *Prime*LineTIAC, Tissue Innovation and Application Center, we have the emtec Tissue Softness Analyzer in use".

Hand Panels for the Quality Assurance of Tissue Products are Outdated

The key parameters for the quality control are the elongation and compressibility of the material, the water absorbency and the hand feel. In the past, with the traditional hand panel test, at least ten people have been necessary to rank or rate the different grades of for example toilet paper. Often it was necessary to send material to test institutes, which are specialized in hand panel testing. Results in a timely manner could not be expected.

Objective Softness Measurement with the emtec TSA - Industrial Standard within the Tissue Industry

An alternative to the time-consuming hand panel method is the TSA, introduced to the marked in 2006, developed and manufactured by **emtec Electronic**, Leipzig (Germany). The Tissue Softness Analyzer is the only test device, which is able to objectively measure the softness, roughness and stiffness of a tissue product. Because of its very good correlation to the human expectation, the industry accepted the device very fast. From now on, it was possible to receive results, provided by an objective test device. Today the device is used by institutes and R&D centers, pulp and tissue mills, chemical suppliers and tissue converters. "The TSA is the only accepted and also from others recognized device for the measurement of the softness of tissue papers. The success has proven emtec right, the device is used worldwide."
This is how Klaus Gissing and ANDRITZ took notice of the test method. Since the beginning of 2019, ANDRITZ has used the device. The installation only needed a square meter space in the conditioned lab. Due to the good training and support by the application engineer, the start-up went well and

◀ ANDRITZ TIAC.

▲ TIAC, laboratory edit.

> “TSA Softness Analyzer is now used in **48 countries**, in each part of the world”

the operators were left with a good understanding of the measuring principle, the handling of the device and the interpretation of the results. “The operators reacted very positively, because they can see the changes in the process”, describes Klaus Gissing and continues: “The handling of the device became routine very fast”.

Process Optimization with Short Response Time and Increased Product Quality

Today ANDRITZ uses the device to optimize machine settings of their customers worldwide, mainly by comparing samples with the device that are made at the pilot machine and at the customer’s site. With the help of the device, such optimizations can be realized faster and more targeted. “After the test production, it takes less than 10 minutes to get the results from the tests in the lab and adjust our production process”, explains Mr. Gissing. “The hand panel tests in the past often took a day, and after the tests it was still not always clear what wheel to turn to reach a certain degree of improvement. The *10 minutes* are a real highlight! The icing on the cake would be to have the complete measurement process online.” Besides all the possibilities the device offers, Klaus Gissing is happy about the boost in motivation which came along with the implementation of the TSA.

▼ ANDRITZ TIAC.

World leader in all major business areas

The ANDRITZ GROUP provides a comprehensive product portfolio for special industries all over the world. With its technologies and service solutions, ANDRITZ is one of the world leaders in all major business areas. The Pulp & Paper Business Unit is responsible for one third of the company’s turnover and is represented globally. Klaus Gissing says: “With the Pulp & Paper Business Unit, we are active in all parts of the world. There are no white spots”. With machines for the converting of trees, the production of pulp, paper and tissue and many more, ANDRITZ offers solutions for different steps of the pulp, paper and tissue production. ●

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"You don't need to take my word for it", says **Sergio Tonarelli**, Chief Sales Officer at Futura. "All customers who have adopted Andromeda define it as the only system capable of adding concrete advantages and making areal difference in terms of integrated performance: namely process control, simplification, efficiency and safety." **Futura** has 11 AFH lines scheduled for delivery in three different continents,

FUTURA:
also enjoying strong growth in the Away-From-Home sector

■ Andromeda System.

North America, Europe and Africa, between 2019 and 2020, six of which are equipped with the Andromeda System. These are top of the range lines, designed to achieve the highest production performance and customized for the specific needs of the target sector, in these cases AFH, and benefiting from a constant process of seeking technological solutions to increase productivity sustainably.
One specific innovative solution, the Andromeda Integrated Robotic System, is the only one in the industry that allows total automation

The global tissue market is increasingly dominated by digitalisation and automation, aimed at better control of production processes, so it is not surprising that Futura's Andromeda System has seen its penetration increasing significantly not only for consumer tissue but also in the AFH segment, where it is recognized as "the best performing on the market".

by: Futura SpA

of the loading, unloading and splicing of reels, and therefore guarantees exceptional levels of safety and extraordinary production continuity.
The system is also able to manage the cleaning of residual paper left on the core of the finished reel, by transporting it with the automatic bridge crane to the cleaning station, which automatically removes the remaining paper leaving it perfectly clean without damaging the core, then positions it in the loading/unloading platform from where it will then be moved to the warehouse. Operator intervention, once again, is completely eliminated.
In addition, Andromeda allows the automated replacement of embossing rolls and enables maintenance operations from the unwinding area up to the rewinder.
This further example of reducing manual operations is an extra guarantee of operator safety. The Andromeda System provides a complete machine enclosure with automatic roofs, which open only when necessary. This means that even at maximum speed, the system is the quietest on the market and guarantees better dust control, as dust is confined within the protected area where it is easier to extract, and plant contamination is avoided. Futura's AFH lines are also equipped with the new F90.B rewinder, capable of reaching a production speed of 1,000 m/min, with the highest standards of flexibility in terms of core diameter and finished product, as well as the option to specify a motorized format change system. Still on the subject of maximum performance, Futura has recently developed calendering and printing units capable of achieving production speeds to match those of the new rewinder, that is to say 1,000 m/min, ensuring top quality products in line with world market standards. As far as embossing is concerned, some Futura AFH lines are equipped with the JOI embosser, which is able to produce in any configuration (Nested/Deco, Point-to-Point, Random Point-to-Point). And thanks to the use of a steel marrying roll, lines can be used with the new "JOI Hydro-Bond" technology to bond paper plies (from 2 to 4) using only water, and no glue. This technology is also applicable to any type of paper, Conventional or Structured.
In addition to the conventional JOI embosser, Futura AFH line configurations can include the installation of a JOI D2 steel-rubber embossing system, developed with the "Zero Deflexion" steel roller technology combined with liquid-cooled rubber rolls. Another unique aspect of Futura's AFH line is the "Janus" cutting system, a band saw able to guarantee the highest performance with high density products, while ensuring the maximum finished-product quality.
These are the main features of Futura's AFH lines which explain why the company is carving out an increasingly important role in this market segment, guaranteeing its customers real competitive advantages. ●

▲ Zero Deflexion Steel marrying roll.

▼ JOI Hydro-bond.

> "Our **objective** is simple: the best product"

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BONETTI

Kemira's wet strength solutions: remain compliant and keep the chemical cost under control

by: Dr. Vladimir Grigoriev, Applications & Marketing, Pulp & Paper Emea, Germany
Eric Padovani, Product Lines, Pulp & Paper Emea, France

For most tissue makers wet strength resin (WSR) accounts for the major portion of their chemical spending. The economics of wet-strengthened grades largely depend on resin efficiency. The cost pressure also comes from stricter regulations of chloro-organic materials, which are suspected carcinogens. The three commonly regulated materials found in WSRs are 3-chloro-1.3-propandiol (CPD), 1.3-dichloro-2-propanol (DCP), and absorbable organic chlorine (AOX). The regulators' concerns arise from the migration of these materials from paper to food or their discharge with waste water, potentially harming people and the environment.

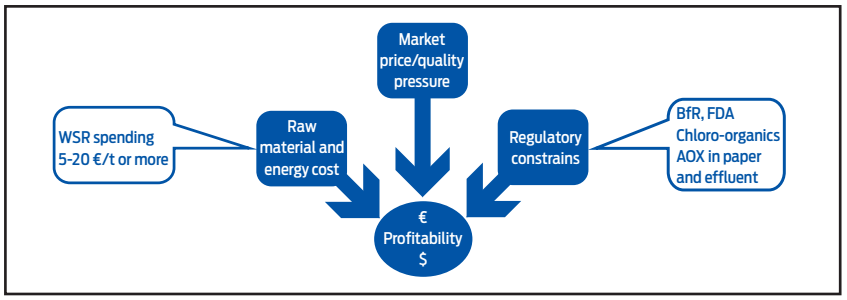
Improving WSR chemistry

Since the mid-1980s, the WSR chemistry has undergone a huge transformation to much lower residual levels of chloro-organics. The existing resins in the market have different levels of CPD, DCP and AOX and are classified as generation (G) 1, 2, 2.5, 3 and 4. The higher the G-number, the cleaner the resin. In the EU countries, the G1 resins are not used anymore since they have to be labeled as toxic and carcinogenic. In addition, G1 resins contain high amounts of unreacted epichlorohydrine. The predominant resins marketed in the EU for tissue are G2 and G2.5; whereas, the cleanest G3 and G4 resins are suitable for coffee filters and tea bags. The cleaner resins are highly technical materials and tend to cost more. Therefore, the main drivers for selecting an optimal WSR are regulatory targets and the cost that has to be balanced out.

Use less WSR and achieve more benefits

The regulatory pressure continues to increase. One example is the EU Directive 2010/75/EU, effective of September 2018, which reduced the AOX limit in the effluent in the wet-strength paper production from 150 to 50g/t of paper produced. Attuned to the industry needs, **Kemira** has developed cost-saving and sustainable technologies for wet-strength tissue production. These include high efficiency and low AOX resins as well as complimentary functional promoters that further improve the efficiency of WSR. Higher efficiency helps not only use less resin and reduce the operating cost but also reduce the level of chloro-organics in the tissue sheet and effluent.

> "Cost-saving and sustainable technologies for **wet-strength tissue production**"



▲Major factors affecting profitability of tissue production.

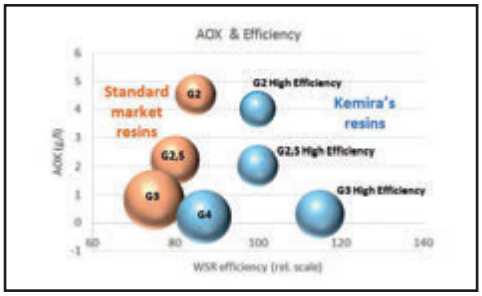
Mill	Grade	Fibers	Δ WSR dosage vs. incumbent	Other benefits
A	Kitchen towel	Virgin	-25%	AOX on target
B	Kitchen towel	Virgin	-17%	Less AOX in affluent, defoamer eliminated
C	AFH towel and napkin	Virgin	-15%	
D	AFH towel	DIP	-7%	
E	Industrial wipes	DIP	-10%	Less felt deposits

Benefits: Chemical savings, Lower AOX in paper and effluent, More balanced change, Lower risk of foam and deposits.

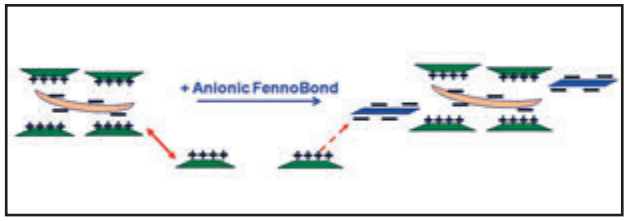
▲Results of industrial trials with Kemira's FennoStrength® high-efficiency wet strength resins.

High-performance wet strength resins

The obvious solution to reducing the cost of wet-strengthened tissue is to use less WSR, without jeopardizing the sheet quality targets, for which Kemira offers high-performance FennoStrength® resins. Often it is possible to reduce the resin dosage by around 10-15%. Lower dosages allow for chemical savings as well as lower AOX in the paper and effluent. Additional benefits can be achieved from machine runnability related to more balanced charge, such as a lower risk of deposits, felt plugging or excessive foam. When AOX in the effluent is on the limit, tissue producers must resort to cleaner G2.5 resins. A drawback of G2.5 resins is that they are generally more expensive to run. Not only is the product cost higher due to higher manufacturing costs, but their efficiency decreases in the post-cleaning process. To overcome this problem, Kemira has



▶ Comparison of Kemira's wet strength resins (blue) of various generations to standard market resins (brown) with regard to the AOX level in the resin (as 20% solids) and on-machine efficiency. The bubble size represents the cost in use.



▲ Anionic FennoBond rebalances the charge on fibers, improving WSR retention and promoting its efficiency.

developed an improved manufacturing technology that allows the production of a clean G2.5 resin without the loss of efficiency.

Functional promoter reduces consumption of WSR

A further reduction in the WSR consumption can be achieved by using anionic functional promoters. WSRs are high charge polymers and tend to overcationize fibers, resulting in decreased resin retention and its low efficiency. Besides overusage, unretained WSR can cause runnability issues such as excessive foaming, felt plugging and decreased dewatering. With the help of Kemira's anionic FennoBond, fiber charge can be rebalanced, allowing for more effective retention of WSR, thus improving the economics and keeping machine runnability under control.

Case study 1: chemical savings and AOX on target

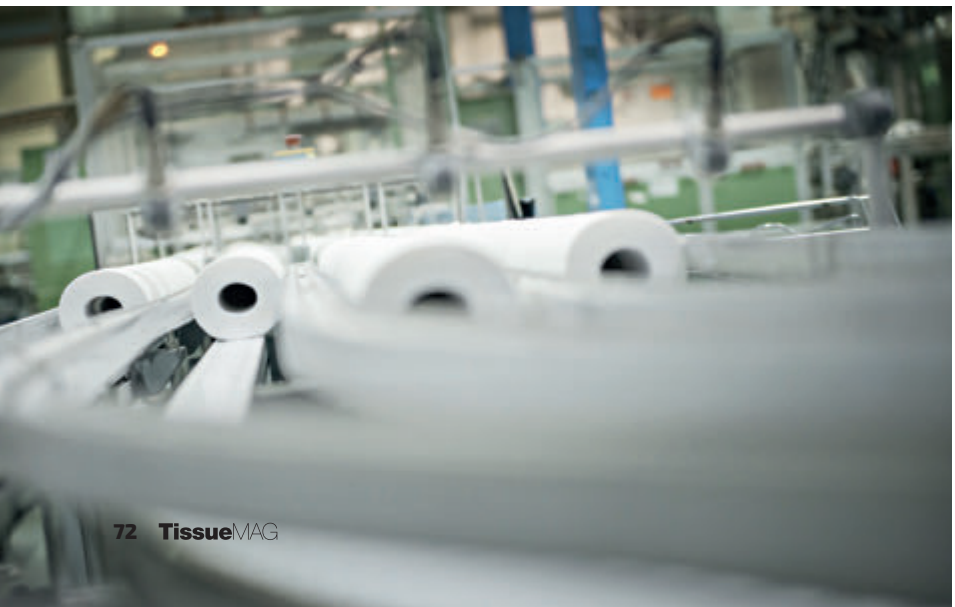
A towel producer has tight control for the AOX level in the paper, requiring the use of astandard G2.5 resin, which contributed to production cost. Reducing chemical cost was important for this machine. Kemira offered a new high-efficiency G2.5 FennoStrength®. The machine trial showed 25% less resin was needed to maintain sheet quality and AOX targets.

Case study 2: anionic FennoBond improves safety and provides economic benefits

A towel manufacturer was using carboxymethylcellulose (CMC) powder to control fiber charge and provide dry tensile. CMC created safety hazards such as dust and slippery floor around the CMC make-down area. CMC was replaced with a synthetic anionic FennoBond that is supplied in a liquid form and only requires a pump to feed the chemical. Anionic FennoBond was not only safer to use, but it resulted in improved WSR efficiency. The wet tensile and dry tensile remained on target at 22% less WSR, generating 10% net savings.

Conclusions

Wet strength resin (WSR) is a key contributor to the cost of a tissue machine operation. The WSR application cost can further increase due to limitations on CPD, DCP, and AOX levels in paper and effluent. Kemira has developed advanced solutions to allow tissue makers to remain compliant with regulations while keeping the chemical cost under control. These solutions include high efficiency and low AOX FennoStrength® resins and anionic FennoBond for charge balance and improved WSR retention. Additional benefits of increased WSR efficiency are improved machine runnability and increased productivity. ●



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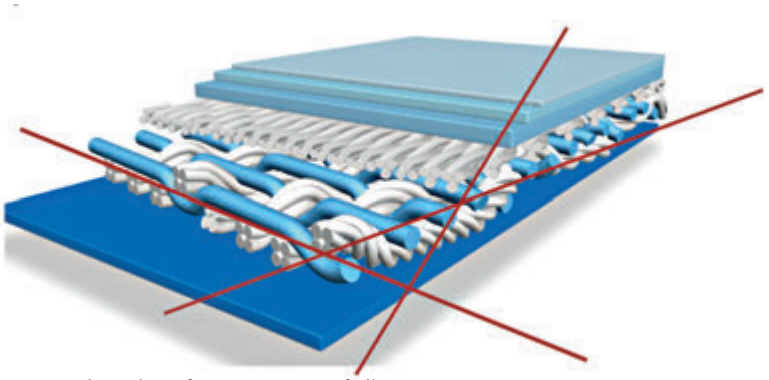
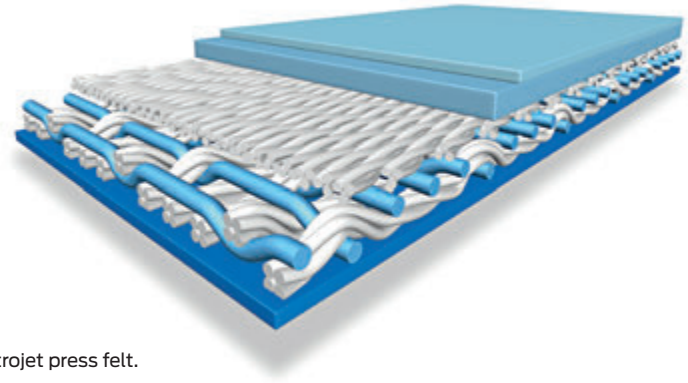


■ Increased number of crossing point of all yarns is the leading feature of multiaxial felt technology.



■ Atrojet press felt.

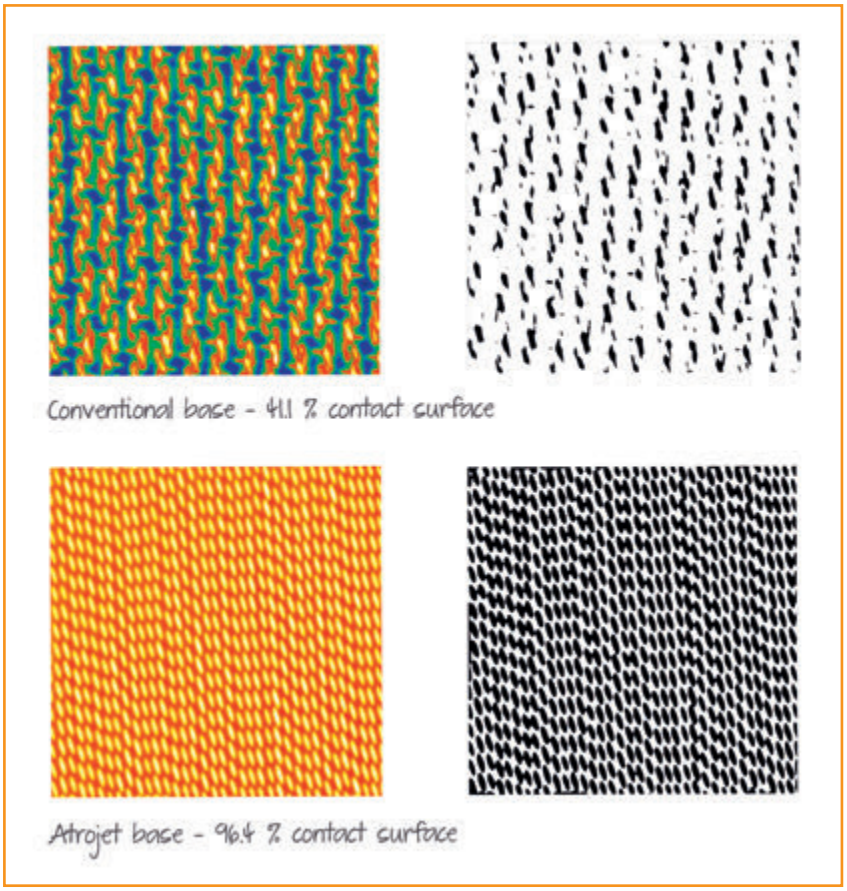
Even at the beginning of its' development, Heimbach product managers were sure: Atrojet has the potential to usher in a new era in press felt technology. "We promised paper manufacturers that we would develop a press felt that creates completely new opportunities", says **Jochen Pirig**, strategic product manager at Heimbach. This has been accomplished, as Atrojet is the first felt worldwide that unites the advantages of Heimbach's 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). 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 is sophisticated **Heimbach** keeps on improving its existing product lines and developing new products.

> "Expertise and customer service provide continuity, **optimisation** and **customer satisfaction**"

TO TISSUE

Tailor made press felt technology

by: Heimbach GmbH

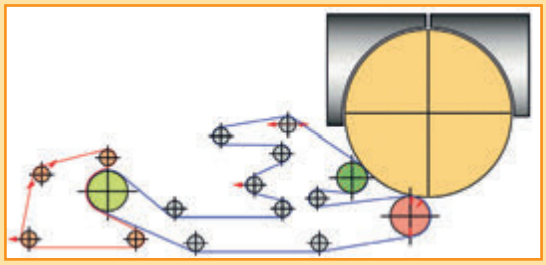


▲With its uniform machine direction yarn structure Atrojet has far greater surface contact than conventional bases. This leads to more even pressure transmission at the press nip resulting in very steady dewatering and even CD profiles.

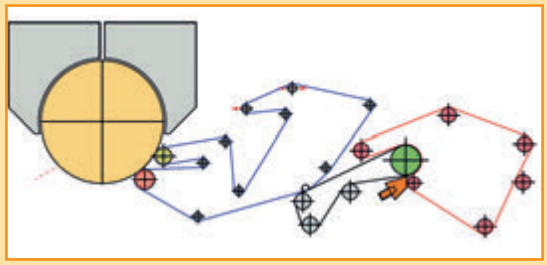
Atrojet is one of the latest developments which is an innovating new press felt design combining the advantages of multi-axial and non-woven technology. With the multi-axial non-woven technology, the product managers can meet the particular requirements of press felt positions even better. The specific quality of Atrojet is the structure of the base inside, which is, facing the paper side, and 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 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

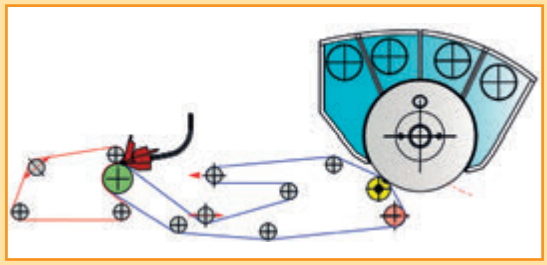
> “**Heimbach clothings** are used in the production of a wide range of paper grades and types”



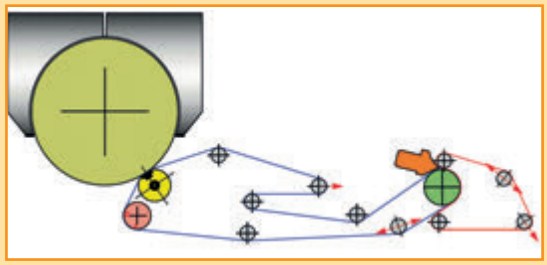
◀Configuration: single width, crescent former with suction press roll and blind-drilled press. Speed: 1,500 m/min. Paper grade: tissue, 16-46 g/m².



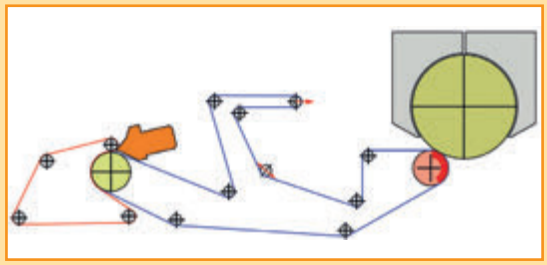
◀Configuration: double width, crescent former with suction press roll and blind-drilled press. Speed: 1,530 m/min. Paper grade: tissue, 12-21 g/m².



◀Configuration: double width, crescent former with shoe press. Speed: 1,950 m/min. Paper grade: tissue, 12-35 g/m².



◀Configuration: single width, crescent former with shoe press. Speed: 1,800 m/min. Paper grade: tissue, 12-40 g/m².



◀Configuration: single width, crescent former with suction press roll. Speed 1,800 m/min. Paper grade: tissue, 16-30 g/m².

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 > 50,000 m³ 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 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 GMBH

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Valmet FORWARD

CPS is definitely ready for the future

"There is no future without memory". There is recognition of the famous quote within CPS which dictates the future according to its origins, treasuring its own history and know-how.

by: CPS Company Srl

A journey for more than 50 years made of design skills, knowledge of the market and its dynamics, attention to the environment and sustainability. In fact its very first packaging machine launched in ´64 used paper as its first packaging material, a material to which today we return, together with other eco-sustainable materials to significantly reduce the environmental impact. On this same machine in '64 paper was used as the packaging material: an ecological and avant-garde approach that is now a must today. More and more companies are thinking of going back to favour paper or other eco-sustainable material hence reducing the environmental impact of packaging is becoming a priority for the consumer and naturally for the entire supply chain. **CPS** has always

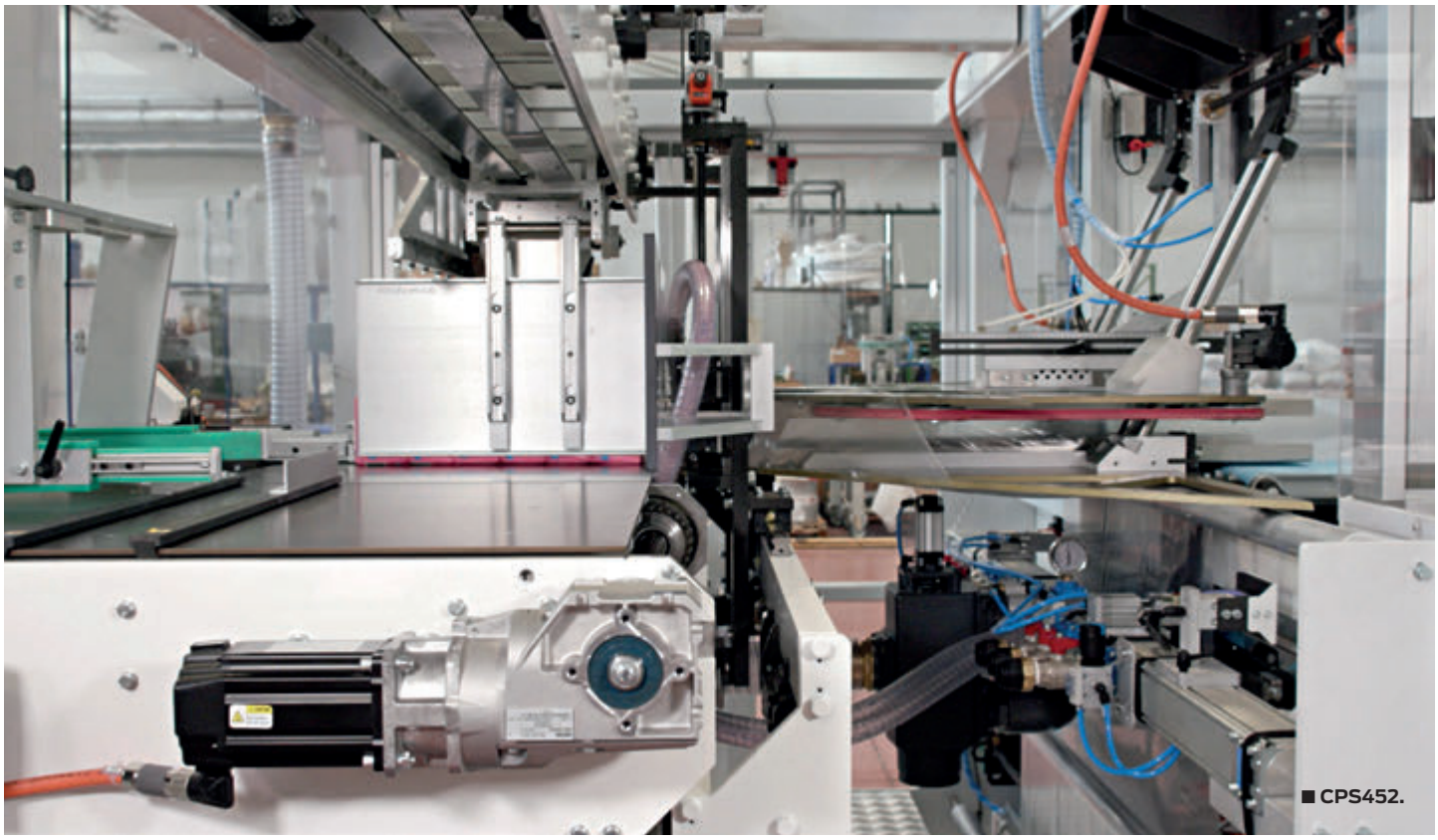
▼CPS pack.

followed this strategy, which has strengthened through a strong transversal competence, acquired in 55 years of experience. That said CPS machines are a guarantee of efficiency in respect for the environment and versatility, ensuring excellent performance in terms of energy savings and consumption reduction. Both small-volume machines and those with very high production speeds for industrial applications are designed to operate quickly and efficiently using sustainable materials for packaging, such as paper or plastic films with reduced environmental impact.

> “Our mission is to build **cutting-edge automatic systems** for disposable paper, tissue, woven and non-woven products”

Research and development for a superior and greener production

CPS has always dedicated a team of experts to the study of technical solutions capable of making their achievements perfect for change as well as being increasingly flexible and even more efficient. With a product range increasingly dedicated to sustainability, CPS is always a step ahead in the market that shows a growing interest for the sustainability with a comprehensive offer of packaging solutions that optimally anticipate the industry demand, every day greener without sacrificing productivity, packaging speed and quality standards.



■ CPS452.

> “Meet the global market needs, improved throughout R&D Department and supported by **our most valuable asset: our clients**”

New sales channels: new solutions and the same winning philosophy

Recently, CPS has developed a strong focus on secondary packaging suitable for new sales opportunities thanks to the excellent centralisation of the print and the growing visibility of the brand, the protection of the product, the reduction in the volume and weight of the packaging and to its greater stability. Those mentioned are just some of the advantages of the company’s equipment which extends the concept of sustainability to as many aspects as possible including energy consumption, material savings, the opportunity of choosing increasingly eco-friendly packaging. “We can say that we know all the secrets of packaging and yet we never stop studying to discover more ecological and smarter solutions guaranteeing even better aesthetic outputs. Moving with determination according to an approach that protects and respects the environment”, comments **Paolo Cassoli**, CPS founder. ●

CPS COMPANY SRL

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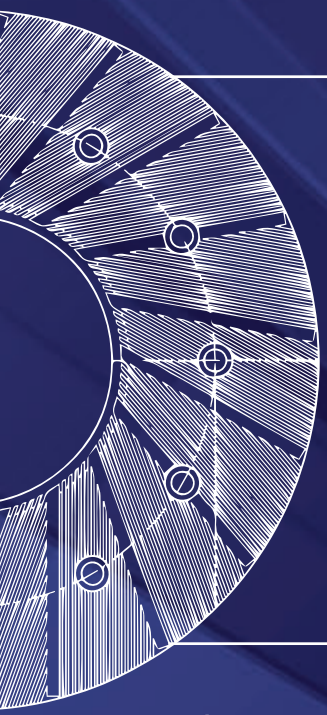

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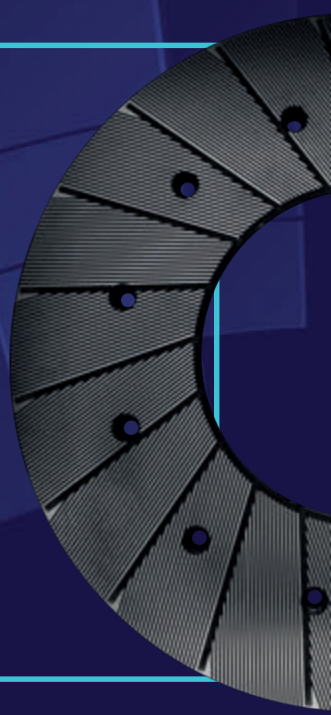

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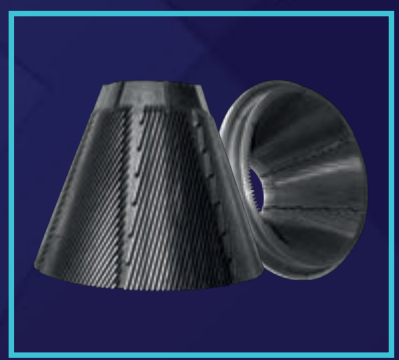

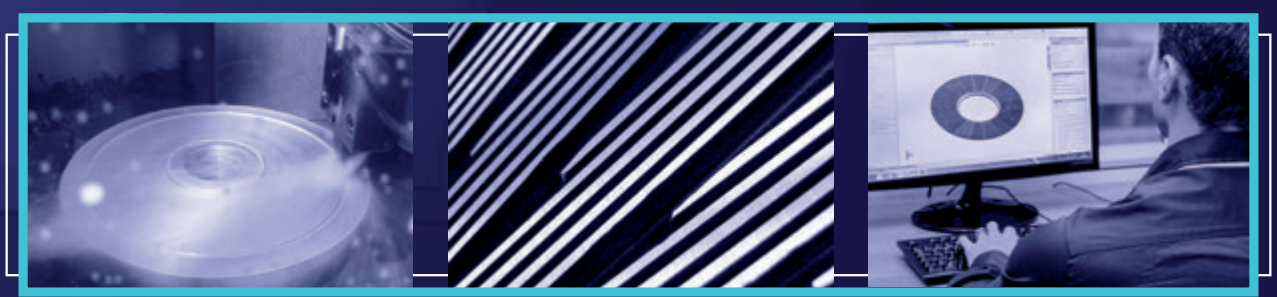

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Value Co-Generation.

Cogeneration and Co-Creation. An acknowledgement to the customers

■ LS 1000 Energy Storage.

Solar Turbines, that is known for the production of energy generation solutions, would like to thank its actual and future customers, in return for the continuous communication of their new and improved requirements: it is the inspiration to develop new products and services satisfying the latest tasks of a challenging market.

by: Solar Turbines Switzerland Sagl

■ Maintenance with InSight Augmented Reality.

These circumstances are defined by the Harvard Business Review as "Co-creation": working on new products and service ideas together with the customers, to produce a mutually valued outcome. Co-Creation will become the inspiration to further develop new products based on a reliable experience gained from over 1,200 industrial Co-Generation plants, with a population of more than 310 installations in the Tissue and Paper Industry.

The gas-turbine, Solar Turbines core product

The most recent models have been shown to be suited also to the needs of the paper industry by enhancing the Taurus 70 family, with versions producing 7.5 to 8.2 MW_e, and the Titan 130, which ranges from 15 to 16.5 MW_e. That power increase goes with reduced CO_2 emissions, to meet paper mills' energy requirements and its environmental sustainability.

Enhanced Fuel Capabilities

Waste fuel capability - from biogas over natural gas to high hydrogen gas, increases the flexibility of fuel choice serving the emissions reduction: over 150 gas-turbines are operating successfully on gas fuel different from natural gas.

New Package design: The Plug & Play Concept by Solar Turbines

Leveraging the experience from over 1,200 installed packages in industrial environment, the new gas-turbine packages design criteria are for example a Co-Generation focused design, operative costs reduction, higher uptime and compatibility

■ PGM 70 package.

> **Power Generation solutions** for Pulp and Paper production

with the Industry 4.0 concepts: the PGM Package family is based on a Plug & Play concept and available for Solar Turbines products from 3.5 MW_e up to 16.5 MW_e.

IoT and Industry 4.0 approach

Enhancing customers competitiveness is not only a matter of developing new gas-turbines: Solar Turbines is embracing the Industry 4.0 concept as a basis to maximize the CHP plant uptime, take full advantage of incentives benefits (where available) and access the smart grid opportunities, as well as for energy storage purposes. Digital control systems are essential to monitor the performance of any production cycle and its energy requirements, at any time, allowing timely interventions, optimizing the process while reducing costs: balancing steam production and turbine power according to the requirements of the production cycle, the turbine is operated according to real needs, once again reducing CO_2 emissions and, where possible and appropriate, sending excess electrical power either to smart cogeneration grids or to the new developed Solar Turbines Energy Storage.

LS 1000 - the Energy Storage by Solar Turbines

Based on the experience in designing gas-turbines packages with integrated control system, an energy storage system has been developed: that complete and integrated system, capable of managing energy changes, comes with a control system fully communicating with the gas-turbines packages as well as with the customers plant grid and the national grid. The Plug & Play storage module, designed as self-contained, forklift solution, is equipped with its own control system managing the thermal control, the on-board power conversion system as well as the firefighting system. The capacity of 1,000 kVA can be used either within 1 hour (LS 1000-1) or 4 hours (LS 1000 – 4).

Solutions by Integrated Applications

Solar Turbines waste experience within industrial cogeneration, is based on the knowledge of the production process, as for example the integration of a yankee hood system with the gas-turbine based cogeneration plant, using the turbine exhaust gases for direct drying purposes in the Tissue Paper production. Following a feasibility study, analyzing the value creation for the customer, Solar Turbines will give a Lifecycle support for the supplied gas-turbine package during the operation, maximizing the turbine uptime and performances by an unrivaled service, as well as closing the loop actual and future owner thanks to the asset redeployment team.
Solar Turbines, that produces energy generation solutions, is integrating sophisticated technologies capable to satisfy customers energy needs with a smaller environmental impact. ●

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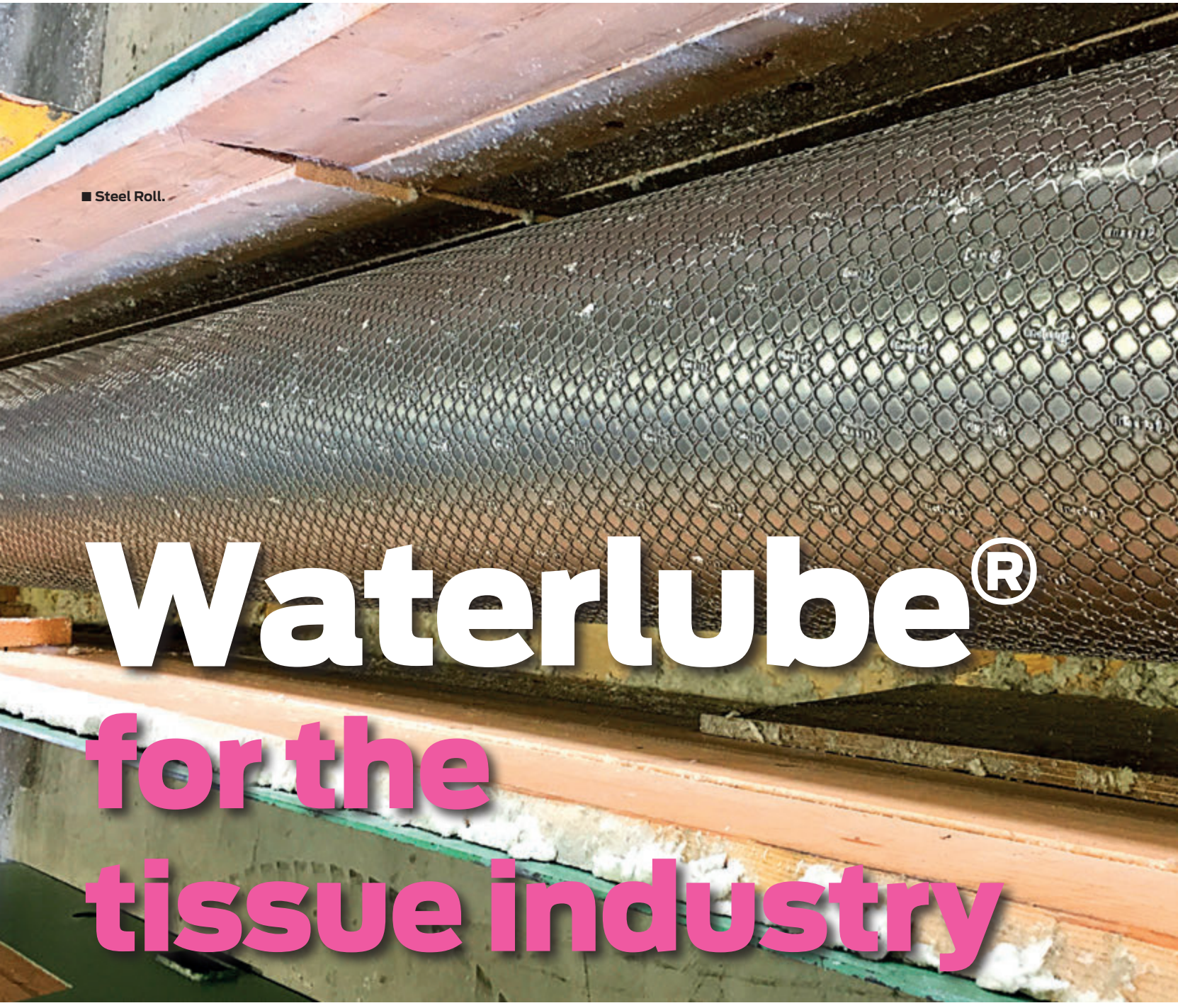

■ Steel Roll.

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by: WVT Industries NV

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- **Flash point, degrees C - /**
- **Solubility in water - completely soluble**

> WVT Industries is a rapidly growing company that specialises in the research, development, production and marketing of **industrial cleaning chemicals**

■ **The Headquarters of WVT Industries NV in Belgium.**

Since the company's establishment in 1997, **WVT Industries NV**, with its headquarters in Aartselaar, Belgium and regional operations in France and Spain and Asian operation in Singapore, has grown rapidly into a leading manufacturer and supplier to the industrial cleaning market.
Their customers include companies from various industry sectors situated worldwide, such as the chemical and pharmaceutical sectors, the automotive industry, aviation, metalworking, printing and packaging, marine, waste management, and transportation businesses.
In addition, WVT is also supplier to many Private Label customers in the Tissue Industry.
WVT Industries provides customers with a broad range of safe and ecologically sound industrial cleaning products. Its product range is composed of over 650 items, varying from acids to strong alkaline cleaners. Additionally the company is able to respond to customer's requests by developing specific cleaning chemicals to solve particular cleaning problems. The company attaches major importance to the environment and endeavours to ensure that its activities have the least possible impact in that respect. To achieve this aim, it

ensures that all of its cleaning products are biologically degradable and bio-ergonomic.

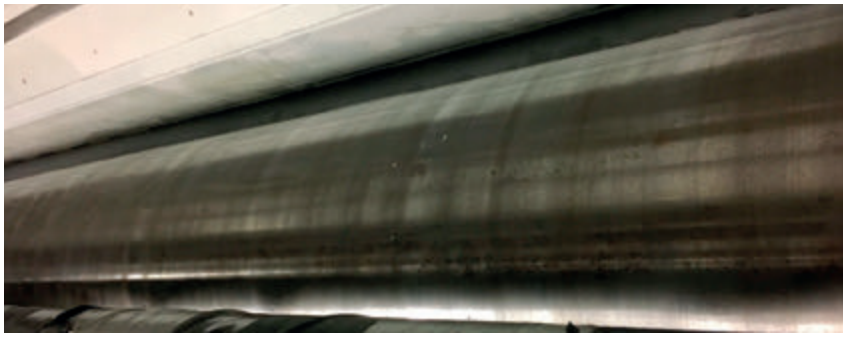
Tailored solution for the customer

For the production of all its detergents, WVT applies the state of the art technologies, using a sophisticated software that controls the accurate mixture of ingredients and the production line, where they can monitor production step-by-step, assuring that each recipe receives exactly the correct amount. Automatic processing reduces human intervention to a minimum. The use of this technique enables them to adapt the detergent formulas to the customer's needs and allows WVT to take into account important factors such as the nature of the pollution that has to be removed, the cleaning techniques and the ergonomic and environmental aspects. After having received contaminated raw materials sent to them by their customers, the Research & Development laboratory analyzes important parameters like the nature of the contamination, the method of cleaning that is currently used (circulation, high pressure, etc), possibilities surrounding temperatures, the human parameters like whether protective gloves or other safety measures are permitted, the nature of the company (paper industry, printing, tissue converting, packaging, etc). With these parameters, WVT can quickly produce a tailored solution for their customer.

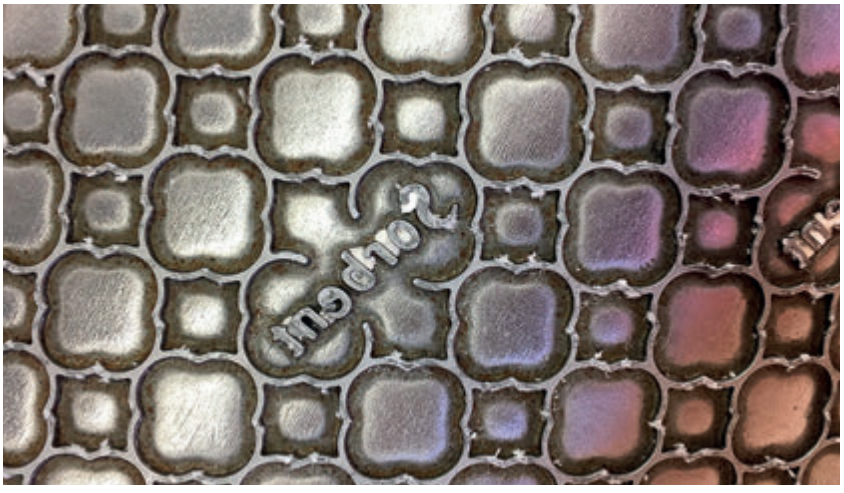
Waterlube® for the Tissue Industry

For the Tissue Industry, in the past few years WVT developed a 100% water-based product, Waterlube®, specially designed for use during the production of tissue toilet rolls and kitchen towel products in the Tissue Converting Industry. It is designed to replace the use of mineral oil lubricants, which have been traditionally used to avoid the build-up of glues on the steel rolls used in the lamination process with steel to steel rolls, pin to pin, nested, micro-deco, micro-macro, perf and fan. The formulation is non-corrosive and will not damage surrounding surfaces or equipment. The product can be applied by spray, brush or felt applied in-line during the production process in an undiluted form guaranteeing a lower consumption with a saving of up to 30% compared with a comparable mineral lubricant. Technically Waterlube® benefits the customer as it has a neutral pH and is completely water-based; it has no flash point and it eliminates the possibility of friction fires generated by the process. Furthermore, it also has a food-grade approved formulation, therefore following today's legal regulations. From ordinary everyday to the most complex cleaning solutions, WVT supplies the customer with a package of chemical cleaning options so that the converter can focus on their own core business. ●

> "WVT Industries provides customers with a broad range of safe and ecologically sound industrial cleaning products, **with over 650 items**, varying from acids to strong alkaline cleaners"



▲ Marry roll.



▼ Steel Roll WL.

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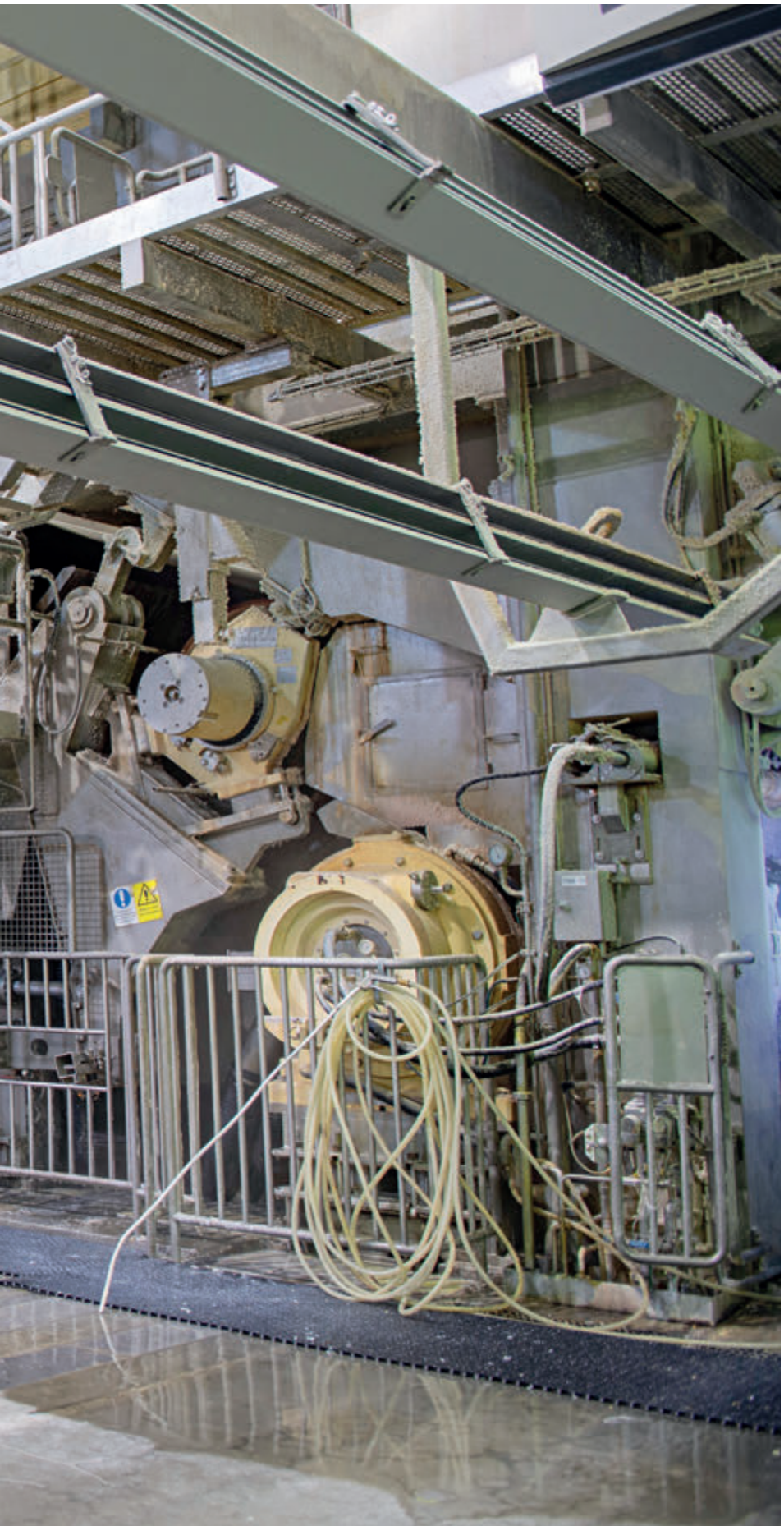
Tissue paper production line startup, a matter of give and take

Running a tissue line installation project involving several suppliers most certainly raises a lot of questions and concerns. A clear vision, well-defined targets and a clear roadmap help to set the direction for all. VelvetCARE in Poland knows what that means in practice.

by: TissueMAG

■ The paper quality has provided new market opportunities for VelvetCARE, especially regarding facial products, and has allowed the company to go for the premium private label market.



For the past 20 years, VelvetCARE has been the leading tissue brand in Poland. Every day, millions of Poles use tissues, wet wipes, toilet paper and kitchen towels produced at the Klucze mill. But their products can also be found on the shelves in the Nordic countries, the Baltics and Germany. In addition to their own brand, they also supply the private label market. To keep up with the growing tissue demand, VelvetCARE decided to invest in a new tissue machine.

Reference visits key to evaluation

"First of all, we were looking for flexible, open-minded and close cooperation. Secondly, we wanted the best technical solution at a reasonable price. Thirdly, we looked at the number of machines from that supplier running worldwide, proving that the technology can deliver what's promised. We weren't looking for promises; we wanted a machine guaranteed to provide the quality and capacity we needed", says **Wanda Ciesielczuk**, Plant Strategic Investment Manager VelvetCARE. "We compared different technologies to find the best solution. Each supplier took us on reference visits. It was a very valuable way to see how the promised features worked in reality. Valmet's reference visits corresponded to what was promised in every way", concludes Ciesielczuk.

> "Valmet's **vision** is to become the **global champion** in serving its customers"

Clear way forward

"We are working according to a well-defined project execution model based on long experience of more than 200 tissue machine installations. During a project, we pass several gates, or checkpoints, to ensure that all milestones related to the gate are fulfilled and everything is in shape to proceed", explains **Hans Englund**, Project Manager at Valmet. The project model also helps to identify what could be a potential risk in the future and make

sure it is eliminated before it causes a problem. "This way of running projects is, from our perspective, the right way to do it. Even if there were strict checkpoints to be fulfilled, we still had good flexibility and could agree on the best way forward", Ciesielczuk says.
The first phase of the project is very intense. All documentation needs to be agreed, time schedules set, and common goals defined. But maybe the most important of all is to build good relations and trust in each other.

Clear and fact-driven communication

"We and Valmet worked truly as one tight team supporting each other throughout the project. The roles and responsibilities were clear, and everyone fully understood what we wanted to achieve. The communication was straight forward and focused on solving issues together", says Ciesielczuk. "Coordination of all people involved is a matter of give and take. We must make sure we have good relations and that we move forward according to the plan. Clear and fact-driven communication ensures correct decisions. Almost ready isn't good enough: either it is ready, or it isn't", says Englund.
During the installation phase, there are a lot of questions that need to be handled quickly. Daily follow-up meetings and transparent communication are of utmost importance, not to mention the value of support from the back office. To know you have an expert network backing up from home adds stability and comfort.

▲ After thorough evaluation, the project team decided to go for an Advantage DCT 200 line equipped with an Advantage ViscoNip press and a F(O)CUS Rewinder. Stock preparation and Valmet Automation were also part of the scope, as well as mill engineering, training, and electrical instruments, among others.

Check-out like clockwork

The project team had, from the very start, one common target in mind: to get ready for the start-up. All people involved were totally dedicated to meeting the start-up date. "The check-out went like clockwork. Everything was so precise. Whenever an issue appeared, it was addressed immediately", summarizes Ciesielczuk.
"The start-up day presented a few issues, as normal, but nothing we couldn't solve. We had adjustments done relatively quickly. From the very first roll, the bulk and moisture profiles were excellent! I had never imagined achieving that from the start", says **Sebastian Główczyński**, Project Manager at VelvetCARE. The machine provides a safe working environment and is easy to operate, which is important to us. The DNA system is very nice. It is a powerful tool to follow the history and trends. We have immediate access to data to support our decisions. The DNA system is a very good tool", Główczyński continues.

New market opportunities

The paper quality has provided new market opportunities, especially regarding facial products. The quality and softness are living up to the Velvet name, and allow the company to go for the premium private label market. In paper handkerchiefs, it is already the market leader in Poland. The installation project has now been closed, but fine-tuning continues. Close cooperation between two professional companies combined with fact-driven communication, well-defined targets and a clear roadmap turned out to be the key to reach the target with the project. ●

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■ VelvetCARE Klucze mill.

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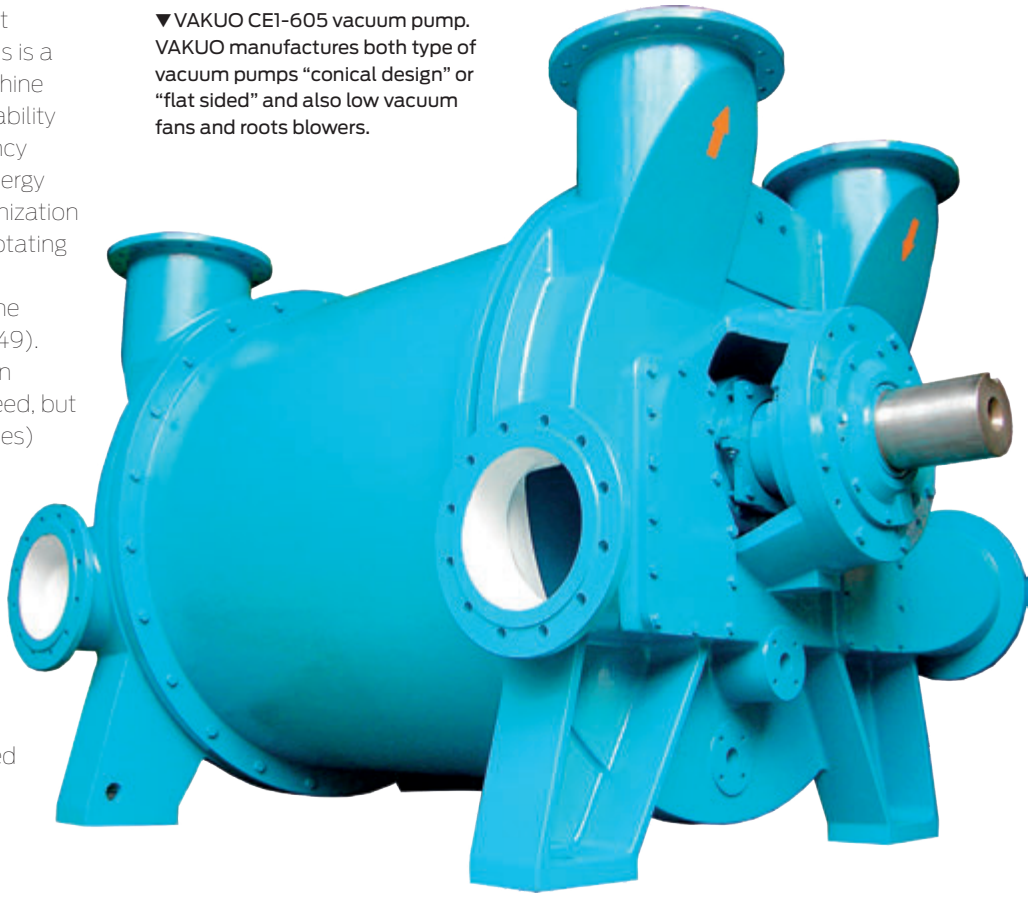
Energy saving with existing vacuum systems using liquid ring pumps

The right condition and correct operation of vacuum systems is a key to the overall paper machine productivity - in terms of reliability as well as in terms of efficiency and energy costs. 50% of energy saving are possible, with a mosaic of optimization measures. We will eventually reduce the rotating speed of the liquid ring vacuum pump by 30% (x 0.7) and consequentially reduce the power absorbed by 50% (as 0.7 x 0.7 = 0.49). We take advantage of leverage: the suction capacity is proportional to the rotating speed, but the power absorbed increases (or decreases) exponentially. It is not new: in the 90s replacing 25 year-old liquid ring pumps through new one, we could reduce the specific consumption and save 50% of energy but this issue became nowadays more and more important.



▼VAKUO CE1-605 vacuum pump. VAKUO manufactures both type of vacuum pumps "conical design" or "flat sided" and also low vacuum fans and roots blowers.

Some relevant topics

A bunch of relevant questions leads to good practices, energy saving and improved reliability: how much vacuum do we really

VAKUO GmbH continues the success story of CUTES Europe Ltd. in manufacturing vacuum pumps for the paper industry - being recognized as one of the leading liquid ring pump supplier - and assisting the mills on their own energy saving projects, looking for energy saving potentials on existing vacuum systems. by: TissueMAG

▼VAKUO CVP-90M vacuum pump. From 2019 CUTES Europe became VAKUO GmbH offering vacuum pumps, vacuum systems, and focusing on the optimization of existing vacuum system in the pulp and paper industry.

need? How to produce it? It is about materials of constructions, about water recycling and fiber recovery, etc. for this we have selected a few frequently asked questions.

When to repair, restore or rebuild a vacuum pump?

We recommend measuring the performances of each vacuum pump on a regular basis, ideally once a year and offer surveys including capacity test and endoscopy. Measuring and collecting data is our first step (and priority) to be able to analyze and optimize.

Repair or replace the vacuum pump?

Is it the right pump for this service? An 100 KW-pump can often save or waste 30 KW. They cost 30 KW x 12.5 Ct/KWh x 8,000 h/a = 30,000 euro/year, which is the price for a new pump. The price for repair or for a new pump is negligible compared to the potential energy saving.

Why does the efficiency of LRVPs decrease?

Wear of critical areas, because corrosion or abrasion, will affect the critical clearances. The worst solution is to increase the rotating speed to compensate the loss of capacity. Deposits of fiber, fillers, scale, etc. will clog the internal paths creating a backpressure leading to an increased power draw.

What is a good efficiency for a vacuum system?

1 KW/m³ min is our target, with pumps that are in good condition and are properly selected for the services. The liquid ring pumps, cooling and condensing at the inlet, take advantage of the "condensation effect" and will handle an effectively reduced volumic flow.

Central vacuum or dedicated pumps?

A system with dedicated pumps for each service (each vacuum) is more efficient as we avoid an expansion, which creates an additional volumic flow: 100 m³/min at -40 KPa become 150 m³/min if they have to be expanded to -60 KPa.

Do we need preseparators?

Yes. Because vacuum pumps are compressors, they are designed to handle air and vapors, not to pump

◀ Drain-pump. The CKD extraction pump is the "work horse" designed to drain the pre-separators under a vacuum up to -80 KPa. Pre-separator and extraction pump are key components for an efficient vacuum system.

> "VAKUO focuses on demanding applications, like paper manufacturing, where a **reliable technology** is required"

▲ VAKUO CNN pump with dismountable bearing brackets. VAKUO vacuum pumps are interchangeable with other brands, they are "bolt-on" replacements (same performances, same dimensions) but offer many features/advantages like for example the removable bearing brackets.

liquids. Liquid ring pumps are robust, they can handle water, but in a very inefficient manner: a pre-separator will improve the efficiency as well as the maintenance intervals.

Energy saving using water at a lower temperature?

Yes, but not directly. Using water at a lower temperature, we would just increase the suction capacity of the pump. We will save energy as soon as we reduce the rotating speed (by replacing the small motor pulley or installing a frequency converter).

"Flat sided" (axial) or "conical design" (radial)?

Both designs have advantages, **VAKUO** offers both. Pumps with "cones" are more robust and more efficient, if we take advantage of the larger ports to recycle more water.
The "flat sided" pumps are more versatile and can adapt to different vacua.

Are LRVP's suitable for variable speed operation?

Yes, especially liquid ring vacuum pumps will take advantage of the above mentioned leverage: adjusting the suction capacity we get an exponential energy saving. We will adapt capacity and vacuum along the lifecycle of the felts. ●

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Save the environment and be competitive, optimizing resources

■ Company management Bruno Collareda with Viviana and Marco.

Optimizing resources, protecting the environment and maintaining competitiveness: these are the three key rules and philosophy that guide the work of OMC Collareda.

by: Viviana Collareda, OMC Collareda Srl

OMC Collareda was founded in 1974 in Schio, in the north-east of Italy, where a generation of brave captains, with a unique entrepreneurial spirit and the ability to put themselves at risk to jump headlong into the idea they believed in, began to sprout. At that time it was called F.lli Collareda, and it was a small mechanical workshop of carpentry construction for industry in general

producing tanks, vats, pipes and their installation at the customer's site. In 1981, understanding the needs of the Paper Industry to recover the process water for their reuse, and the recovery of raw materials contained in them, it began the adventure of designing and building equipment suitable for these goals, with the development and construction of the first "self-cleaning" sand filter, currently still in production. In those years some changes in the company name took place, which led F.lli Collareda Sdf to become **OMC Collareda Srl** and, with the aim of creating its own products, resources were dedicated to the development and design of other technologies for the paper industry, not only for water treatment and recovery of raw materials, but also for auxiliary equipment to be installed within stock preparation. The turning point of the company came in 2016, when Bruno Collareda, one of the founding partners and the entrepreneurial mind of the company, decided to liquidate the other partner, because of incompatibilities that in the long run would have led to the destruction of the company. This choice was not painless, especially at a personal and moral level, but it was necessary and fully supported by his son and daughter, who had already been in the company for many years, and by the employees and collaborators. A considerable economic commitment, rewarded by a new company organization, a more serene and livable working environment, a more collaborative and efficient team working method with confidence in its employees and, last but not least, a further growth of the company, which in two years has seen an increase in the technical and production staff of about 10 new elements. This continuous evolution of the company has always brought important new contracts in the United States and in Central and South America, as the recent acquisition of a new order for a complete water treatment plant, worth about € 6,000,000.00 from a new Mexican customer. Currently the fields of activity are design, production, assembly and start-up of plants for water treatment from industrial and civil processes, biological plants, primary water treatment, sludge dewatering as well as plants for stock preparation for the paper industry, for any type of paper, and complete deinking plants. OMC Collareda can say that it is able to satisfy any customer requirement at 360 degrees: from closing the internal water circuit at paper mills, applying flotation and filtration systems suitable for primary water recovery, to the treatment of waste water through biological Anaerobic and Aerobic plants, with the recovery and reuse of the water treated through filtration, Ultrafiltration and Reverse Osmosis. Experience and structure allow the company not only to build customized equipment, but also to develop any engineering project in specific sectors, to built turnkey installations anywhere and to carry out studies

■ **Biological plant paper mill Mexico.**

> "OMC Collareda was one of the first companies back in 1995, to obtain **UNI EN ISO 9001 quality certificate**"

▲ Sedimentator Biological plant paper mill Mexico.

▲ Reverse osmosis plant paper mill Mexico.

▲ Ultrafiltration plant paper mill Perù.

technologies. OMC Collareda was one of the first companies, back in 1995, to obtain the UNI EN ISO 9001 quality certificate, a guarantee of quality and efficiency of production and management processes.
A wide range of products and technologies that many have tried to imitate: what makes the difference, however, is the ability to be a partner for customers and not just mere suppliers.
This is precisely the company's strength: to meet customers in person, with an accurate technical file, with detailed plans of the plants and a preparation that comes from the long experience in the field. OMC Collareda evaluates case by case proposing the most suitable and customized solutions in compliance with the regulations and the customer needs: recovery of raw materials, water recovery and energy saving.
Not only being able to offer its technology in the world but also to praise its total component Made in Italy is now one of the greatest satisfactions of the company. In fact, the whole know-how is Italian: design, study, ideas, insights, are part of the culture of which the company is proud. However, the company vision does not stop within the Italian borders, the OMC brand is wellknown all over the world: it is difficult to say in which countries there is not at least one plant of the company. OMC Collareda do not forget sustainability and environmental protection. Water is precious: an indispensable resource and source of existence. For forty-five years it has been the passion of the company, what it strongly believes in and therefore protects.
The company is aware that the future will bring new challenges and will therefore continue to invest in the Italian territory but with a globalized view, with a constant commitment to the search for new technologies for a sustainable world and in the training of human resources. ●

> “Every case is evaluated in details, proposing the most suitable **customized solutions** in compliance with the customer's needs”

to improve existing water cycles, with a special attention for all engineering and design services. A specialized technical department constantly applied to the research and development of new projects to be able to keep up with the times, which is essential nowadays to be competitive and to be able to constantly update the proposed

OMC COLLAREDA SRL

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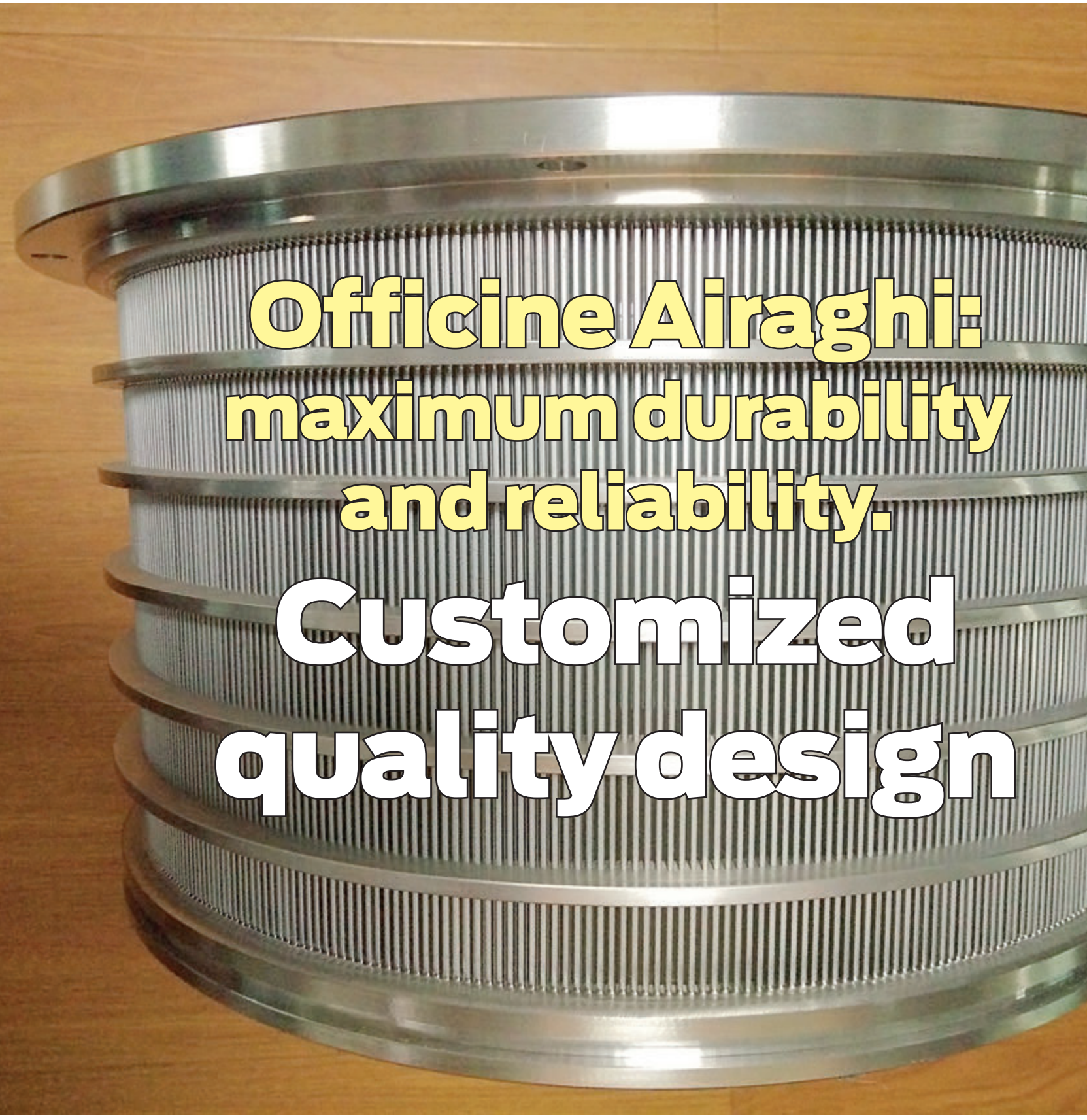
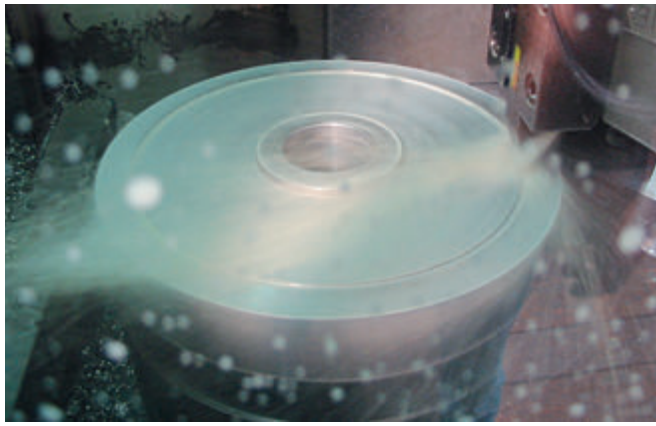


Officine Airaghi: maximum durability and reliability. Customized quality design

■ Airaghi IQ Screen basket.

▲ EFP discs installed on refiner.



▲ Turning operation on a disc refiner spare.

For Officine Airaghi being a supplier means being able to offer a service and a specific technical advice to its customers. In fact, it is thanks to a strong sector specialization that it can remain competitive in global and globalized contexts such as today's.

by: Officine Airaghi Srl

With its 70 years of experience in the stock preparation field, Officine Airaghi brings its clients a wealth of knowledge and the newest technologies for the production of spare parts such as discs and cones for refiners, spares for deflakers, screen plates (or sectors) for pulpers, sleeves for shafts, impellers and shafts, basket screens and much more. The experience acquired throughout this seven decades allows us to have a deep knowledge of technical and maintenance problems. The company can design and manufacture all spares parts for stock preparation machinery with a very quick turnaround.

Officine Airaghi product range

Refiner spares. Officine Airaghi is able to supply both disc and conical refiner spare parts for all brands on the market. All products are made using a MILLING CNC Machine, so the pattern (bar, groove, angle) can be easily modified and changed according to customer's needs. For conical spares, we offer a wide range of moulds as well as milled solutions (CNConic®, internationally patented). The company can manufacture every common pattern and geometry required by paper mills machineries, such as short conical fillings with shallow angle (Conflo), low conical fillings with shallow angle (Jordan), short conical with large angle (Claflin).

Deflaker spares. Officine Airaghi can supply all the most popular deflaker spare parts on the market (toothed rims or casted). In specific the company manufactures: drilled deflaker discs in stainless steel alloys thermally treated; toothed rims in stainless steel alloy thermally treated, from 270 to 950 mm diameter; deflaker monoblock castings in stainless steel alloys thermally treated. Additionally, can manufacture deflaker's parts based on new models and castings, if the paper mill requests it.

Other spare parts. Officine Airaghi has a long history in the stock preparation field and has developed and manufactured other spares for many different machines and applications. In particular: basket screens with holes and/or slots in stainless steel alloys for any basket model and

machinery; screen or pulper drilled plates in special new alloys, with better performance than AISI 304; impellers and shafts in stainless steel thermally treated; sleeves for shaft protection in stainless steel thermally treated or with hard surface (ceramic, etc.).

> We **design and produce** various types of spare parts for stock preparation machineries

Topic of interest: cellulose refining and role of appropriate milling components

The refining process can be considered as one of the most important stages in the paper production using cellulose as a raw material. As a matter of fact, refining can be considered as the only process in the whole paper mill system in which fibers are physically modified, to reach the right balance between flexibility and bonding capacity.
The choice of the most appropriate refining intensity is fundamental and is dependent on the selection of a spare part that can optimize energy consumption and obtain the best results for the final product.

▲CNC turning machine.

Customized precision with milling technology

Officine Airaghi has developed a specific manufacturing method for achieving this result: the milling technology. Thanks to the milling technology it is able to design and produce spare parts specifically tailor-made for each customer, without any fabrication restriction in realization, which is not possible with traditional methods like casting, fabricating and welding. Paper mills can choose among an infinite range of solutions and combinations of geometries, patterns and sizes with the warranty of a constant fulfillment of characteristics (both of fillings and fibers) throughout the lifetime of the spares.
The milling technology is the only solution that allows extreme customization because of the precision in execution of the new generation numerical controlled machines (CNC).
The attention for details and the accurate fillings finishing obtained by the use of CNC machine tools make the perfectly perpendicularity of bars and grooves and the consequent reduction of friction and of energy consumption possible.
This will translate in maximizing the hydraulic capacity and the refiner efficiency maintaining constant values through the spare lifetime.
Another key factor is the consistency of refining parameters set up. All milled fillings made by Officine Airaghi maintain the bar and groove dimensions, throughout the entire filling lifetime. In fact the bars in our spares will maintain their rectangular section independently from wear while castings filling will not.

Our mission: competency, quality, reliability, precision, punctuality

Officine Airaghi offers its clients a complete and very high quality service, from the design customization and specific technical study, to the manufacturing and final execution and delivery of spare parts. The delivery time is prompt and fast, typically they can manufacture a spare in less than 30-40 working days (EXW). All Officine Airaghi quality standards are guaranteed by the Certification UNI EN ISO 9001:2015. ●

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OVERMADE: technology, solidly rooted

▲ Overmade Crescent former tissue machine supplied in South America.

■ Overmade headquarters.

by: Overmade Srl

Four years have already passed from that sunny Autumn of 2015 when, through an operation of Management Buyout, OVERMADE (a company founded by ex-Managers of OVER Meccanica), acquired the exclusive property of all OVER MECCANICA's tangible assets, covering brand, know-how, references, drawings, patents, stocks, machineries and equipment as well as the right to use the original facilities based in Verona. With a background of more than 400 plants installed around the world by the previous entity since the early 60s, **OVERMADE** makes the most of the wealth of knowledge and first-class expertise that has been inherited and that is rooted in a past of pioneering technology. Focused on customer needs and strongly oriented to process streamlining and problem solving in all paper production related issues, OVERMADE constantly looks to ECO and LOGIC solutions to develop and carry through its projects. The continuous researches of performance and

> "OVER is universally acknowledged as a **leader in the manufacture of tissue** making machines"

▲Overmade headbox installed on a CR C22 Crescent former machine.

▼The reel of the CRC20 Tissue machine.

> We **engineer, design and manufacture** complete paper machines, complete tissue machine and winders

improvements above the solidly rooted technology, together with a continuous pursuit of quality, permitted to fully satisfy customers and achieve a fast expansion. Great successes have already been achieved in these four years: in the paper & board machines market, OVERMADE already supplied complete paper machine sections within paper machine major rebuilds or supplied technological parts in new paper machine installation; in the tissue machines market OVERMADE was already capable to supply, within a good number of rebuilding, complete machines including winders and applying upgraded solutions to the installations.
"We concentrated our R&D efforts in all tissue machine sections", is underlining **Marocchio Stefano**, President and CEO of OVERMADE.
"From forming to press, from drying to winding section. OVERMADE keeps innovating its machines to acquire the most eco-logical and eco-nomical results in terms of fiber consumption and power saving but also to keep up to the sustainable trend overrunning our market. We are going towards a green path in order to provide a faster yet better production stock to our clients, but the high quality still remains."
OVERMADE received an enthusiastic reaction to proposed solutions especially in the forming section. The Dynaflow headbox and the OVER Former CR were rapidly considered a reference point in the market on account of the outstanding quality, softness and properties of the paper produced on them. In the last installations the company was able to improve those quality and achieve, through the improved formation of the web and other two important targets: higher consistency forming and lower softwood fiber consumption. Higher consistency forming permits to use less energy in the fan pump area and consequently a lower specific energy consumption to produce each ton of paper. The lower softwood fiber needs in the paper allow to save the cost of fiber. Customers that are operating machines from different suppliers experienced that, to produce the same type of tissue, on OVERMADE Crescent former they were consuming less softwood fiber (softwood fiber consumption saving in the range of 15% has been reported).
The results have been obtained optimizing the microturbulence created in the Dynaflow headbox turbulence generator and improving the jet landing in the Crescent former section with a "cleaner free jet landing" on the wire/felt dewatering edge. "We do not throw fibers in the machine, we comb them".
Over the years, OVERMADE has expanded its geographical markets by serving customers from north America, South America, Europe, the Middle East to Asia (Indonesia and China) with high quality services, customized supplies with sustainable solutions and complex systems to the tissue paper industry.
The current number of repeat orders from the customers shows how satisfied they are with product but also competence and expertise. ●

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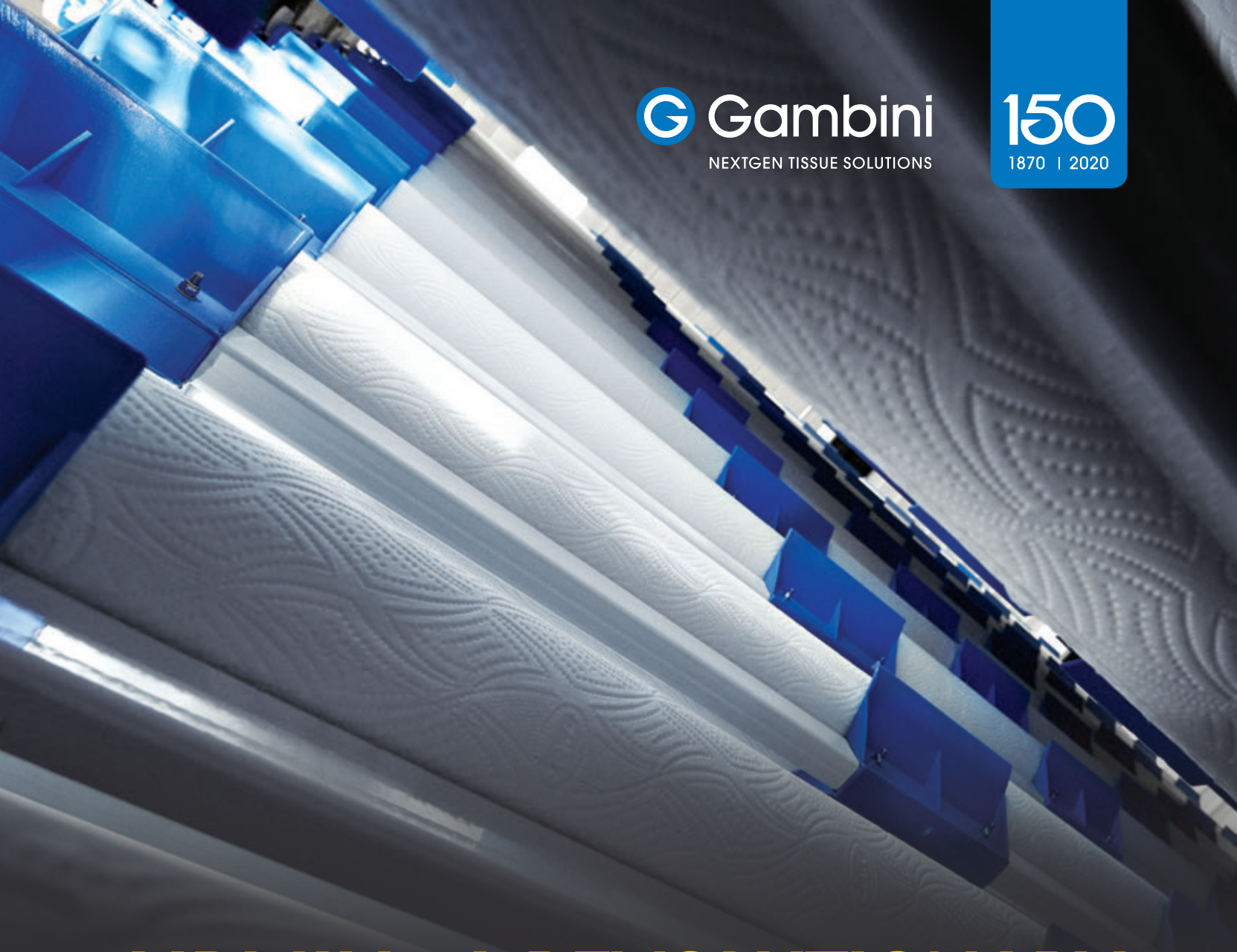

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NEXTGEN TISSUE SOLUTIONS

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AIRMILL, A REVOLUTIONARY EMBOSSING TECHNOLOGY

THE HIGHEST QUALITY OF TISSUE ROLLS WHILE SAVING ON RESOURCES

Gambini's **Flex** Converting Lines provide the capability to obtain results never before achieved in converting. The unique and revolutionary embossing system, resulting from the combined use of **AirMill** technology with the **TouchMax** quick-change embosser, gives customers the capability to produce tissue rolls with remarkable benefits compared to standard products in the market. **AirMill** technology adds limitless advantages to the converting process in terms of efficiency and flexibility while creating benefits and new opportunities even for the paper mill. Come and test the potential of **AirMill** technology on our **G4U** Pilot Line at the **TissueHub**, Gambini's new Technology Development Center. Book your trials at **marketing@gambinispa.it**

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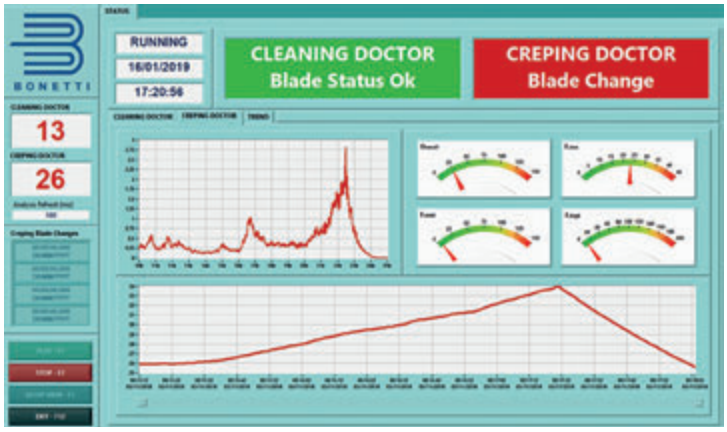
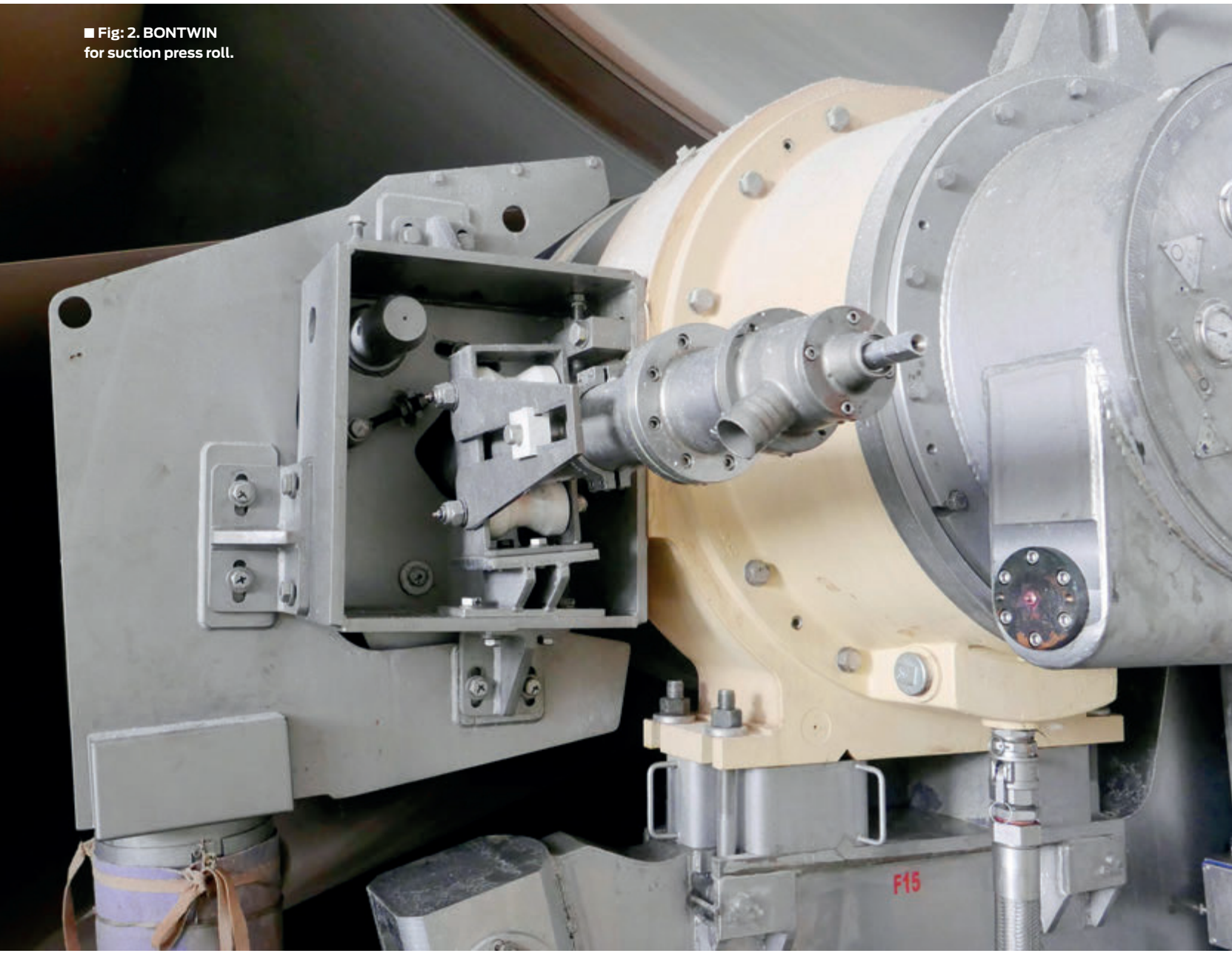
BONETTI to better service the Tissue Industry

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. by: Bonetti SpA



▲Fig: 1. BONVIBES Vibration Monitoring System.

Over the years we've helped numerous customers improve their creping process, taking a comprehensive approach that spans from the blades to the doctoring equipment, them being both part of the current product portfolio. The main areas where the company 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** has been therefore bringing to the industry new tools and new products.
A good example of two new tools are the BonVibes, the new vibration monitoring system (**Fig. 1**), and the BonTwin, the double-doctor system for the press roll (**Fig. 2**).
BonVibes is used in the Tissue Industry to monitor the status of the cleaning and creping doctors of the Yankee dryer. By monitoring and analyzing the detected vibrations, BonVibes' software informs the tissue maker on the correct timing to change the blades, thus reducing at a minimum the risk of chatter marks formation. Main goals of the BonVibes are: protection of the Yankee dryer surface; real time monitoring and alarming; historical Data trending. BonVibes has an intuitive and user-friendly operator interface. Two versions are available,



■ **Fig: 2. BONTWIN for suction press roll.**

with one or two acquisition channels. **BonTwin** is a double-doctor system especially designed to improve dewatering of the press rolls in Tissue machines. **Features & Benefits** of the BonTwin double doctor are: improved dewatering of the press, reducing the rewetting in the Nip; improved press efficiency; increased dryness, with consequent reduction of the energy required to dry the sheet; uniform moisture profile; improved cleanness of the press; increased life

> “Now in the third generation of family ownership, Bonetti has been and will continue to be a **global partner** of paper mills and paper-machine manufacturers”

> “Bonetti’s success has always been based on a timely response to the **needs and demands of the markets** it serves”

▲Fig: 3. Felt Roll Doctor complete with shower pipe and internal cleaning brush.

▼Fig: 4. MIZAR creping blade.

of the press; increased life of the felt; reduction of the numbers of breaks.

Global partner of paper mills and paper machines

Bonetti is a worldwide leader in the supply of doctoring systems (**Fig. 3**) and blades (**Fig. 4**). The portfolio offers a complete range of creping, coating and cleaning blades, in various materials and sizes. Focusing on the creping process, it offers two different types of tip coated creping blades: the MIZAR (Chrome Oxide) and SIRIUS (Chrome Carbide) blades.
When compared to traditional carbon steel blades, they offer extended lifetime and greatly improve the softness of the sheet. These two blade qualities complete each other: whereas the MIZAR offers the longest possible lifetime, the SIRIUS, while sacrificing a small amount of lifetime, allows a smoother blade start-up, they are not prone to chipping and can be machined with sharper angles suitable for Super Soft tissue grades.
Bonetti’s specialists can supply a complete audit of the doctoring systems and the blades in use. For doctoring systems the audit includes a geometric check of the mechanical condition of the doctors. For blades, the audit includes a check of all the blades used as well as an analysis of both existing wear and of wear pattern. The technical and sales team can offer all necessary information and assist you in the implementation of your machine to keep operation running at peak performance. ●

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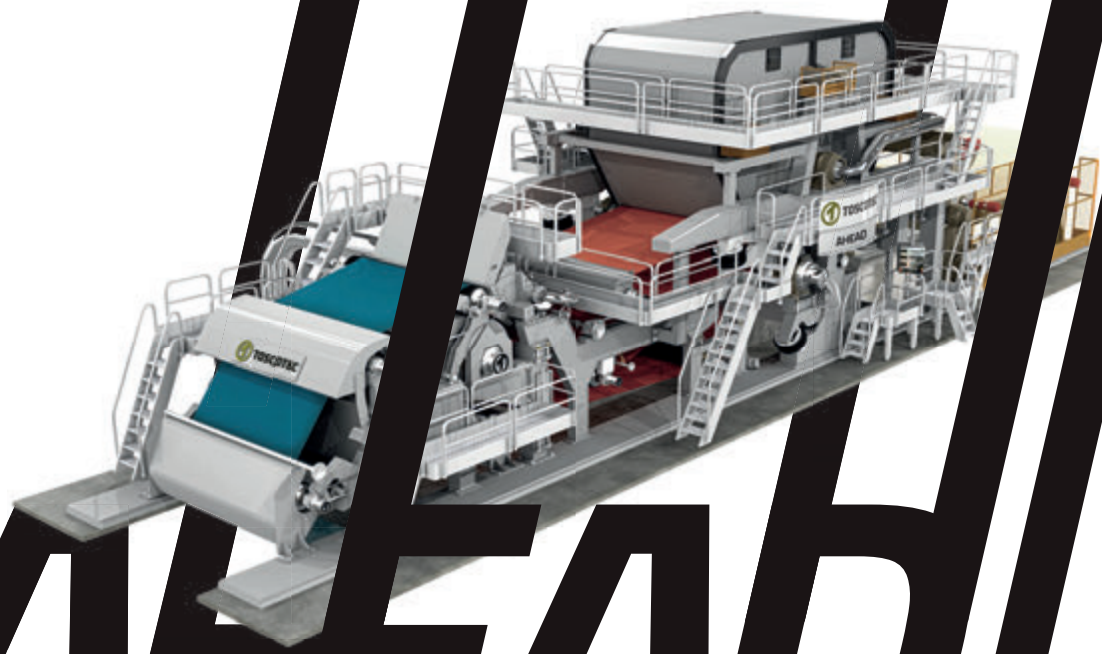
SPEED? AHEAD!



TOSCOTEC AHEAD LINE
PERFORMANCE BY TOSCOTEC

Speed is not an option and when joined by leading-edge technology, evolved engineering and the highest levels of performance, it becomes a must.

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the high-speed tissue machine range capable of attaining 2,200 mpm and producing high-quality tissue from virgin and recycled fiber with proven energy savings, maximum efficiency and reliability.
The performances your business was just waiting for.

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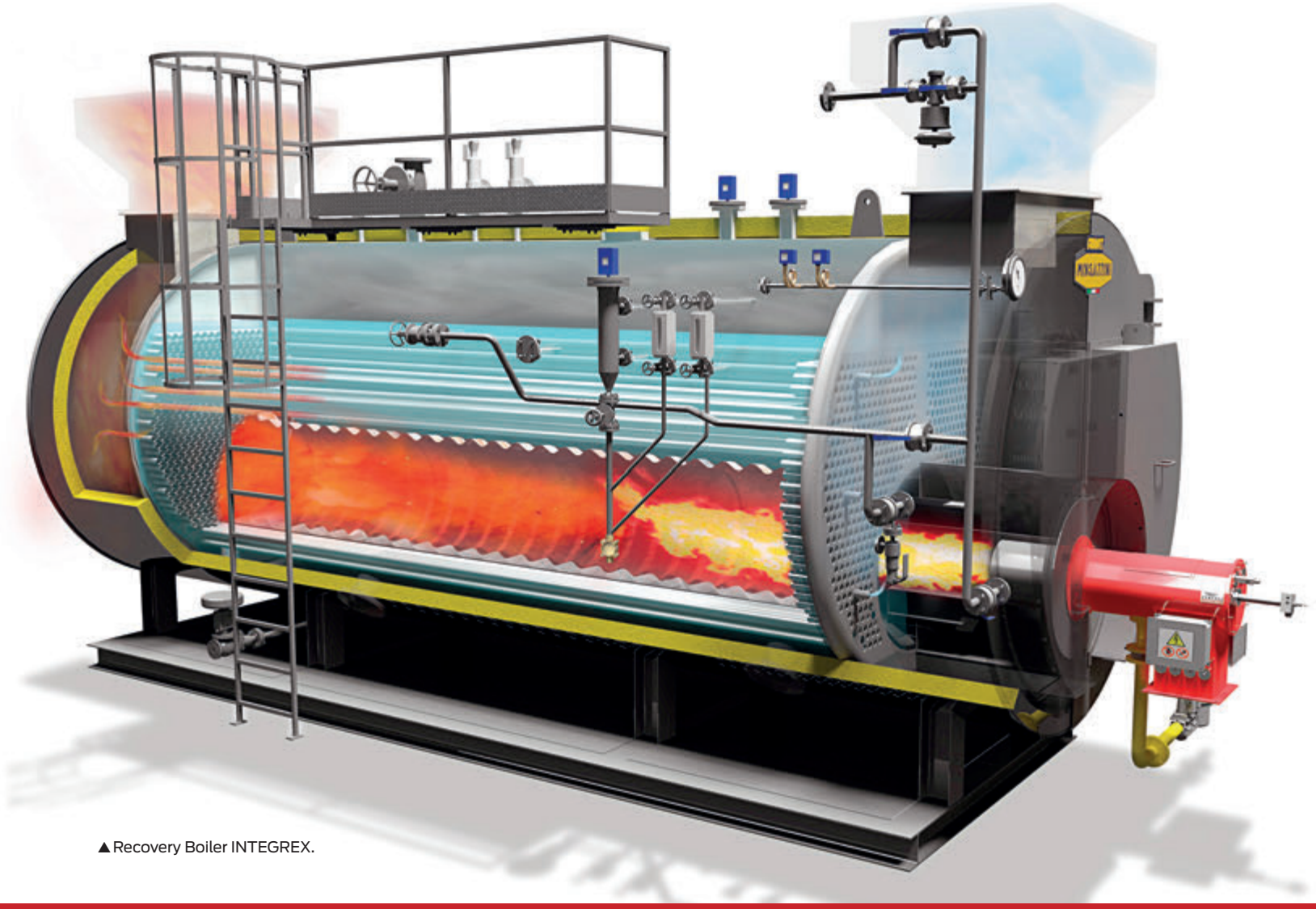


▲Recovery Boiler INTEGREX.

Fomat, systems and technology for paper mills

Bruno Giannelli, founder and partner of Fomat, describes his company's range of paper-making components, highlighting its focus on innovation, high-quality and energy efficiency.

by: TissueMAG

▲Bruno Giannelli , founder and partner of Fomat.

Fomat is based near Lucca, northern Tuscany, where it was founded by **Bruno Giannelli** in 1973. It started as a commercial company, supplying quality service and innovative products to the renowned local paper industry. The company evolved very rapidly, starting to manufacture its own solutions and expanding its geographical markets.
Today it serves customers over the world, supplying high quality and energy efficient products and complex systems to the paper industry.
Fomat comprises four divisions: Technologies, Aerothermic, Automation and Handling.
The Technologies division offers a wide product range, including felt and wire cleaning systems, water filters, basis weight control valves, monoflow and duoflow rotary joints, Yankee Doctor blade oscillators, edge cutters and tail cutters, and Yankee coating systems. The Aerothermic division takes care of complex systems dealing with air and steam handling. Its focus is on paper drying and creating a healthy paper mill environment. Its range of systems includes Yankee hoods, hall ventilation, Yankee head insulation, and dust and mist removal solutions, as well as steam systems for tissue machines.
The Automation division is focused on paper mill management and process control, offering quality control and distributed control systems.
Recently, the Handling division has been added, which allows **Fomat** to increase its product range with conveyors, expandable shafts, shaft pullers and the handling of the paper roll up to converting.

▼Conveyors.

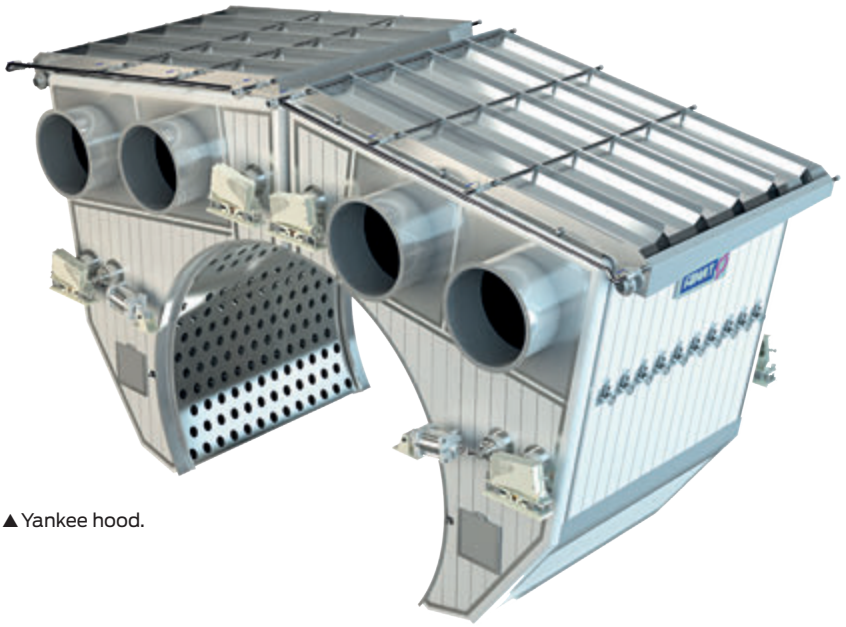
Innovation is a must

"All our divisions are very important", Bruno Giannelli remarks. "Our aim is that of providing optimal solutions for our customers' needs. The solutions we provide to paper mills are always tailor-made, in order to fulfill this objective. Even the components that we provide to paper-making machine manufacturers are customised, according to the energy needs of the country in which their final customer is based. Energy efficiency, quality and ease of use are at the very heart of what we do", states Giannelli. "For this reason, innovation is a must. This energy efficiency was possible thanks to our Integrex product, a heat exchanger and boiler. Basically, the burner only ignites to produce the small amount of steam that it is needed. The space saving result was possible through the use of a combo solution. As all its components are pre-assembled at our premises, this solution also minimises machine downtime during installation and future upgrades, as the necessary work can be carried out in only seven days."
The company operates from a sole site, comprising four buildings, with planning permission gained to build a further facility here. All production takes place at these premises, because the company has a vertical production model, internally taking care of all the necessary production processes, from raw steel to final product. No outsourcing or delocalisation strategies are employed.

▶ COMBO air system.

> "**Knowledge** and **technological innovation** for paper mills, with systems that guarantee reliability, production quality and energy savings"

Geographically, the company supplies its solutions all over the world. "We have customers all over Europe, North and South America, Africa, the Middle East and Australia, as well as Japan and Korea", says Giannelli. "We serve customers in every market that demands high-quality products. Our future is one of innovation. We have new cleaning systems for felt and wire. I expect significant demand for them, as they offer better cleaning results, while lowering water consumption. We will also bring the market products and complex systems with increased energy efficiency, which I think will be successful, as I believe that reducing energy consumption will continue to be a vital factor for any manufacturing company." ●



▲ Yankee hood.

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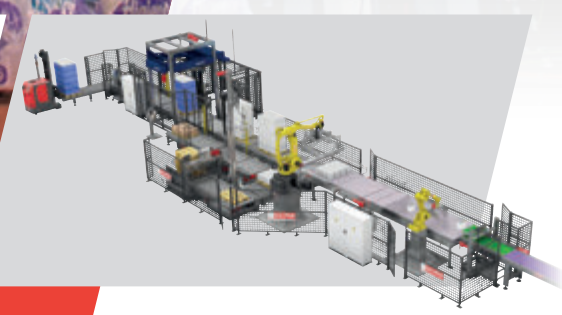
END OF LINE SOLUTIONS



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Upgrade your power

■ Centrax Generator Sets.

Looking to extend the life of your power plant? Need a repowering and renovation partner who has a wealth of experience in existing gas turbine installations? Who can renovate not only their own equipment but other manufacturers' too? Maybe it's time to talk to Centrax Gas Turbines.

by: Centrax Gas Turbines

Centrax Gas Turbines offers a range of power packages using up-to-date technology that can be used in combined heat and power (CHP) which is ideally suited to paper production - making it better for the environment and better for profits. **Centrax** has designed and installed gas turbine packages for nearly 60 years and understands the importance of generating reliable and efficient power. Which is why it has invested in a comprehensive service system throughout Europe and Russia - to provide local support and maintenance, ensuring that units are in optimal condition and leaving customers free to take care of their core business.

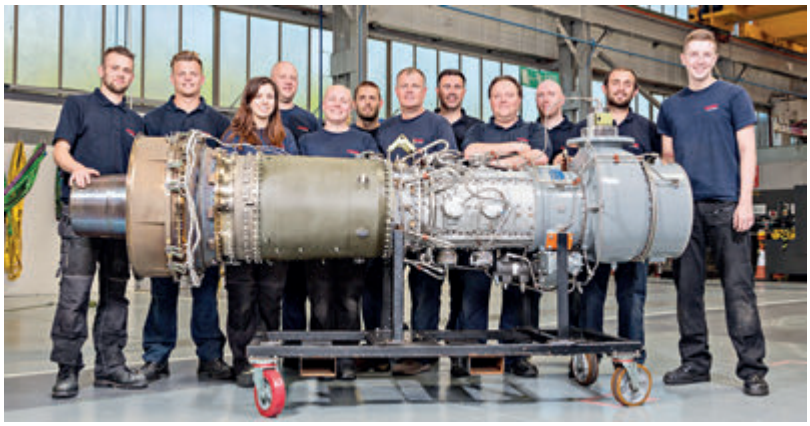
All of Centrax's generator packages use reliable, high-performance Siemens core engines, and with power outputs ranging from 3 MW to 15 MW, packages can be scaled to match customers' specific needs.

This power range is ideally suited to the demands of paper production with packages offering excellent operational flexibility.

In Italy, Centrax Gas Turbines has supplied Favini Srl papermill with a CX501-KB5 high-efficiency cogeneration power plant.

The indoor unit provides 3.8 MW of electricity plus 23 tonnes per hour of saturated steam used in the papermaking process.

Favini benefits from Centrax's in-country customer support centre which services the unit as part of a comprehensive maintenance contract.



◀ Centrax Gas Turbine Engine.

◀ Engine Workshop at Centrax, Newton Abbot, UK.

Centrax Gas Turbines specialises in the manufacture and service of gas turbine-powered generator sets ranging from 3 MW to 15 MW that use core engines from Siemens. The generator sets are used mainly for combined heat and power but also in base load, simple cycle and standby applications. It is a global company with a broad customer base throughout the world. Centrax has invested in a comprehensive service infrastructure that has earned it an excellent reputation in customer support leading to a 100% customer loyalty in maintenance contracts. This assured after-market care supports the lives of units and maximises revenues for its customers throughout the life of the generator sets.

“Generating **trust** with clean and efficient **power generation**”

Another CX300 8.5 MW is powering Ahlstrom Munksjö, Saint-Séverin, France, a world leader in the production of sulphurised paper for the food industry. The generator set powers the site and produces steam and electricity for the plant and its processes. One of Centrax's longest-standing customers is Smurfit Kappa Roermond Papier in the Netherlands, who has been running four CX501 packages at its paper mill for the last 36 years.
These units have been serviced by Centrax throughout. In 2015 the units reached a one million-hour milestone, and a recent decision to upgrade the control panels to a state-of-the-art digital system was a vote of confidence for the longevity of the 501 engines.
In 2016, Centrax Gas Turbines strengthened its relationship with Smurfit Kappa with an order for two 5.3 MW gas turbine generator sets to replace an existing CHP plant at a paper mill in the UK.
The two CX501-KB7 DLE units are linked to waste heat recovery boilers to provide both electricity and steam for the paper manufacturing process. Unlike conventional power generation, CHP not only provides electricity but also makes use of the waste heat produced.
This thermal energy can then be harnessed to create the steam, hot water and hot air needed in manufacturing processes. ●

▲ Centrax Limited headquarters, Newton Abbot, UK.

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Tissue:

◀ Martin Jauch, Senior Vice President Tissue, Voith Paper.

Martin Jauch, Senior Vice President Tissue, Voith Paper, heads up the new Voith tissue organization. Discover what this means for the industry in our in-depth interview. How does Voith's position as a full-line supplier ensure customers gain a competitive edge?

by: TissueMAG

in full swing

Martin Jauch, let's start with your role and vision for the new tissue organization.

My goal is to concentrate on our tissue activities worldwide. This means putting a global focus in our development and simultaneously taking local customer needs and market trends into account and adding even more customer benefits. We will use our existing strengths and experience to further expand and increase our footprint in the tissue industry. Our digitalization drive alone secures a real value-add for our customers.

How will tissue customers benefit?

We are respected in our field as the reliable partner with a strong technology focus. Our new tissue organization will build on these strengths. The focus will be 100% on tissue, backed by the full potential of Voith's expertise as the full-line supplier in the industry. We offer innovative solutions, products, service concepts and digital portfolio. By bundling our experience across the whole papermaking process for tissue, we are in a position to develop the market further together with our customers.

Voith is renowned as a full-line supplier not only for all paper, but also for all tissue applications. How has Voith built up such expertise and trust?

Voith built and sold the first-ever tissue machine worldwide! We have at our disposal unrivaled expertise at the Voith Tissue Innovation Center in Brazil. Our Fiber Technology Center in Germany covers all grades, as does our automation competence. Our domain knowledge doesn't end there; it extends over fabrics, clothing and covers too. As the full-line supplier, we provide complete process competence from one single source. This is a huge benefit for our customers. Of all the tissue machines on the market, our XcelLine offers the fastest start-up, highest availability and shortest erection time.

Since 2015, customers from around the world have purchased over 25 XcelLine tissue machines. These were chosen by customers after their own due diligence evaluation of Voith machine efficiency, paper quality and low energy consumption. We also supplied the world's fastest tissue machine with a steam-heated dryer hood. This TM 16 for Cheng Loong in Taiwan produces up to 2,001 meters of tissue every minute. It set new technical standards when it went into operation.

Tell us more about the success of the innovations for tissue.

We have succeeded in transferring tested and proven Voith technologies to tissue. Take for instance the NipcoFlex T. This development of our shoe press technology specifically for tissue saves on natural resources and reduces energy costs significantly. Other innovations also include the EcoChange T and, of course, the MasterJet Pro T headbox. This works without recirculation, which reduces energy consumption. Together, and combined with our LowMist Former layout and automated dust-eliminating steam hood, these innovations ensure the highest solid contents and high efficiency, and really make a difference when it comes to serviceability, energy consumption and overall performance.

Tissue manufacturing comes with a unique set of hazards. How does Voith reduce the risks?

Safety is a crucial component in the design of all our products. Our technology fulfills all international standards, such as pressure codes for Yankees. **Voith** engineers developed the high efficiency dust removal system to reduce the risk of fire. Our design improves the overall operator environment, which is secured by our equipment accessibility and maintenance.

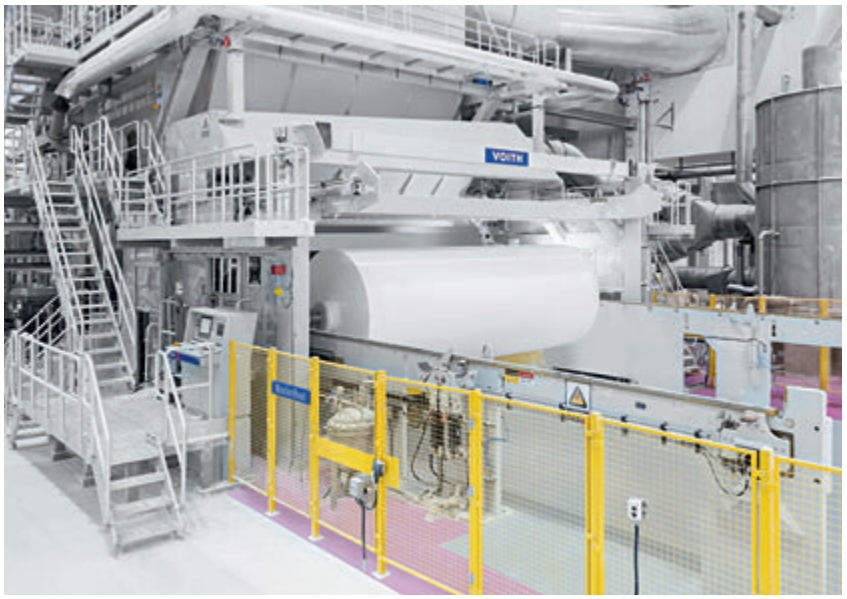
What's happening in the area of pulp?

Fiber makes up 60% of production costs. Our BlueLine stock preparation solutions ensure highly efficient fiber handling.

In addition, our IntensaPulper IP-V for virgin fibers contributes to reducing energy consumption, improving maintenance expenditure and lowering fiber loss.

And on the digital side?

Papermaking 4.0 applies equally to tissue operations as it does to other paper grades. Including in the use of artificial intelligence. Conventional means to measure paper properties and derive machine settings take time and disrupt the process. Papermaking 4.0 reduces this delay - which immediately translates into higher efficiency. Virtual sensors bring reliable and fact-based data about the process. Such insights reduce uncertainties and lead to stable and predictable operations. Our one-stop Industrial Internet of Things cloud platform, OnCumulus, provides tissue manufacturers with a customizable central hub for data analysis and applications. For instance, the OnEfficiency Strength module uses sensors to determine sheet strength. And, as with all of the XcelLine machines, our OnCare Asset Management portfolio is an essential component for predictive maintenance and performance monitoring in tissue production. Tissue will also enjoy the same benefits of virtual reality as all other paper grades. Voith is the first company to use virtual reality on a large scale for paper manufacturing. Starting with the 3-D model, customers can experience their machine before purchasing. And I mean really experience what it is like to walk through and use the machine. Virtual training will not only speed up the learning curve, it will also help improve performance. Ultimately, as with all our customers, tissue manufacturers will benefit from our digital twin. This is an exciting development that will change how the industry will work in the future.



▲ An impressive line-up: high-quality tissue rolls.

> **Tissue manufacturers** will benefit from our digital twin

Finally, a word about your dedicated services for tissue?

One word covers it all: Servolution. This is about customer-centric solutions. In practice, we offer so much more than just spare parts. By providing overall solutions, our customers improve their productivity and reduce costs. In the field of tissue, we offer specialized OnSite Yankee Services, as well as a mechanical roll service contract. In addition to conventional services, such as supervision, startup, optimization or alignments, Voith offers machine audits. Our Availability Service and Productivity Concept will bring existing tissue equipment to the next efficiency level. ●

▼ At the core of the Cacia project: the XcelLine tissue machine.

VOITH PAPER GMBH & CO. KG

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Read more on www.sulzer.com/IoT-monitoring

SULZER

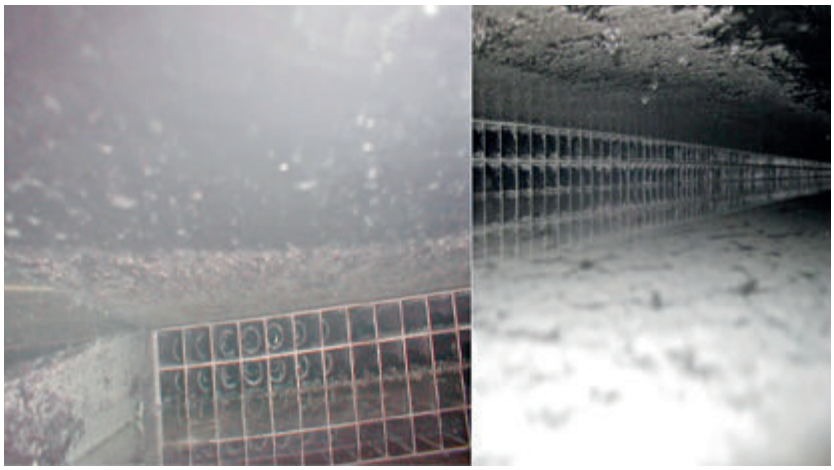
■ Detail of the SMARTJET system.

New success of MARE in deposit control

▲ Detail of the SMARTJET system.

by: MARE SpA

Dear Reader of TissueMAG, lately we have been on these pages describing our results in yankee coating chemistry. In this occasion, we would like to describe our capabilities in terms of Deposit Control and some excellent results **MARE** obtained in this field, in particular in the field of organic deposit control.
Our company is able to offer a full range of chemical programs to control the formation of organic deposits (namely pitch&stickies) directly in the stock preparation or passivating the surface of the clothing of the paper machine. In case where the organic contamination is very high, deposit control strategies in the process can be supported by chemical programs cleaning the clothing of the paper machine without the need for a machine stop. The action of our chemical programs for deposit control can also be integrated projecting a proper cleaning of the machine frame and internal circuit through a boilout during scheduled shutdowns.
In general, organic deposit control is based on a dispersion fixation approach, where a dispersant will be applied in the thick stock, for example in the pulper, and a fixative will be fed later in the system, for example in the mixing chest or machine chest. Dispersion approach may be integrated or substituted by a detackification strategy, mainly based on inorganic or polymeric substances which eliminate the 'tackiness' of the pitch stickies surface. This approach will be preferred in systems with very high contamination, such as mills using poorly cleaned deink pulps or 100% waste paper, where the number and size distribution of organic particles is very high even from the very first stages of the stock preparation.
Our experts will bring into your mill all the expertise and 'know how' needed to choose the correct strategy to your specific problem.
Some Case Histories follow.



▲On the left hand side of the picture you can see the headbox internal surfaces before the application of our MARECLEAN BS 900 in the process, on the right hand side after.

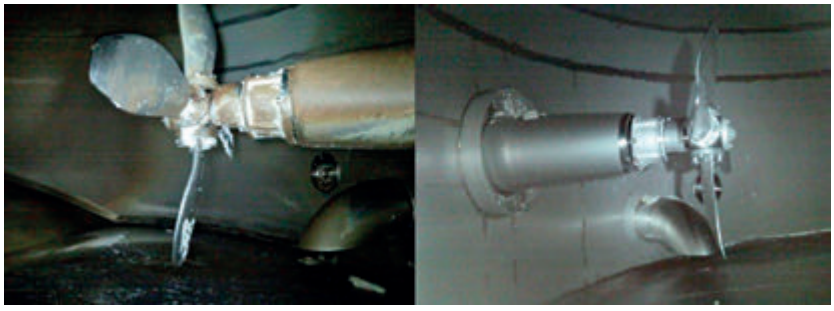
Case history 1

A tissue mill was having repeated problems with stickies accumulation on the forming wire.
The only solution was to stop the machine and run batch-down cleanings. MARE introduced the application of the product TR SY 400.
The chemical was applied batch-on-the-fly, no machine stop was needed. The treatment was first applied on a side of the wire to show the cleaning capability of the chemical, then on all the width of 5.8 meters of the clothing.
The wire came out clean with the use of a few dozenths of litres of cleaning aid. The total operation didn't take more than 30 minutes.
It was demonstrated the chemical is not carried into paper at all due to its volatility.

Case History 2

A mill was experiencing a high level of stickies accumulation on the wire due to combined use of poorly washed deink pulp and short fibre polluted with evident pitch contamination. The wire was treated with our chemical TR CC 30, which provided soon a barrier against stickies on the fabric. Lost time for shut down cleaning was reduced from 2 hours a day to 2 hours every week.

▼A comparison is shown between the appearance of the internal surfaces of a mixing chest, before (left hand side) and after (right hand side) the application of our MARECLEAN BS 900 in the process.



Case History 3

A mill was experiencing severe clothing contamination due to the use of converting rejects contaminated with glues and industrial adhesives in general. For this reason it was not possible to increase the percentage of converting rejects on production over 2 % - 3 %.
With the addiction of MD PAPER GR, inorganics based detackifier, it has been possible to increase the amount of converting rejects up to 9 % - 10 % while maintaining a suitable runnability.

Case History 4

A tissue machine was suffering form pitch&stickies deposits in the short loop and fabrics.
These problems were completely solved by adding the chemical MARECLEAN BS 900 to the virgin fiber and broke pulper, to white water and to the polydisk spray bar. The fixative MAREFIX LP 250 was also added to the mixing chest and the chemical MARECLEAN FC 737 was added batch-on-the-fly by a spray bar into the nip between the felt and a turning roll.

> “Functional and process **solutions** for paper industry”

Clothing cleaning by chemical programs can be combined with state-of-the-art spraying technologies which allow the application of chemicals in specific sections of wires and felts.
An example of this technology is the SMARTJET system newly released by FOMAT.
With this technology it is possible to apply the chemical treatment only on a specific section of the clothing. The cleaning head comprised five nozzles head which can be rotated by 90° degrees in order to modulate the intensity of the cleaning action. ●

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This is better for the environment and better for your profits.

What's more, Centrax provides a complete package of expert maintenance and customer service – leaving you to take care of your business. So as well as saving energy at your plant, we save your team's energy too.

We've designed and installed gas turbine power packages for over 70 years. Our products range between 3-15 MW and have earned a reputation for being clean, modern and efficient.

They could transform the way your paper plant uses power.

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Digital printing on napkins: endless possibilities for success with the new Chameleon by OMET

Maximum flexibility and efficiency with the new Chameleon by OMET, the digital printing unit developed by OMET for the tissue market.
Now Chameleon is available on all OMET machines, both for mechanical and vacuum folding solutions, and can process paper rolls from 180 mm up to 800 mm.
The highest printing quality is guaranteed up to speed of 200 m/minute on any kind of paper, including point-to-point embossed napkins and airlaid materials (non-woven fabrics), with low pre-printing costs and different graphics for each napkin.

by: OMET Srl

■ **Chameleon by OMET allows to print napkins one different to the other, with no pre-press costs.**

Chameleon by **OMET** offers superior performances and quality to tissue converters, who are looking for solutions both economical and brilliant in the eyes of the market. Digital technology allows an increase of efficiency with cost reduction, and an upgrade of the portfolio with innovative proposals. Its endless possibilities for customization allow customers to use folded products as a marketing tool, going beyond their innate use.
Digital printing ensures also greater flexibility and speed in the execution of works: the easy configuration of the software used for managing the line is the key for shorter production and delivery times (just-in-time). It allows quicker job changes, the update of graphic projects anytime, the reprint of any subject as needed, without having to stock obsolete products.
"The amount requested for each printed subject is increasingly smaller", explains **Fabio Secondin**, Digital Printing Manager of OMET Tissue Division. "Digital technology allows appropriate margins even in these cases because avoids start up and storage costs, increasing at the same time the ease of use of the machine. With digital printing, the product and the brand can be enhanced and increase their value in the tissue industry."
This way, printers can efficiently support short runs for customized products, even with variable data. The cost reduction can reach 50%: you can

> "OMET **tissue converting machines** combine full digital controls, ease of use and high printing capabilities"

■ Some samples of napkins printed by Chameleon, the inkjet digital printing unit by OMET.

print directly from files, with no need of plates, clichés or pre-press works. Chameleon digital printing by OMET is managed with a software installed on a PC on the machine: it's simple and intuitive for any operator, it allows printing of all kinds of graphics and variable data at a 200 meters per minute speed, with just-in-time delivery. Digital printing is a step beyond even in terms of color brilliance: it has a very wide color range with fine lines and very small texts, difficult to obtain with traditional printing technologies. This allows the printing of high quality photographic and landscape images: photography is the top level of product customization, because the number of prints originated from digital images taken by users is really booming.

"Now digital printing is available on all machines of the OMET portfolio, with the possibility of printing any type of material", says **Marco Calcagni**, OMET Sales & Marketing Director. "We are going to satisfy one of the most important requests of converters, who increasingly need to differentiate and offer new ideas for final products: for example, companies using product customization for their marketing campaign, for particular events, or users of online printing services. OMET's continuous innovation and technology allow them to take advantage of more and more flexible production opportunities and increasing levels of automation." ●

> "More than 50 years of **passion** and **excellence**"

■ A TV 503 configured with Chameleon inkjet printing unit has been showed during last OMET open house in occasion of Tissue World Milan 2019.

OMET SRL

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Second Hand Machines
A Matter of Trust

There are many reasons in favor 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 focused on the comparatively small, yet growing tissue and towel 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. Two of the most trusted dealers in the tissue industry are TISSUE TEC Sales & Service GmbH and SERVIPAP.

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 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** and SERVIPAP is to preserve the interests of both parties and to handle their projects accordingly. Lastly, a trusted machinery dealer has a global reach that many brokers or sellers do not have at hand. Proof of this is shown in recent projects managed by TISSUE TEC Sales & Service GmbH and SERVIPAP covering the following regions from origin to destination:

- Complete Industrial Rolls Line from Spain to USA;
- Complete Industrial Rolls Line from United Kingdom to Mexico;
- Napkin Wrapping Machine from Germany to USA;

■ A complete United Converting industrial roll rewinder line supplied to the USA in 2019.

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 and its partner company SERVIPAP.

by: TISSUE TEC Sales & Service GmbH

■ A complete PERINI/CASMATIC bathroom tissue/kitchen towel rewinder line supplied in 2019.

- Complete C-Fold Handtowel line from Finland to USA;
- Bathroom Tissue Wrapping Machine from Colombia to Dominican Republic;
- Bathroom Tissue Wrapping Machine from Hungary to Ecuador;
- Bundling Machine from Australia to Jamaica;
- Complete Bathroom Tissue/kitchen Towel line from Italy to South Africa;
- Two Complete Industrial Rolls Line from United Kingdom to USA;
- Complete Bathroom Tissue Line from Italy to Ecuador;
- Complete Bathroom Tissue Line from United Kingdom to Dominican Republic.

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 and **SERVIPAP** are also providing the full range of service such as machine relocation (including disassembly, transportation, re-assembly and all customs documents), refurbishments or intermediate storage. In the past, we have successfully realized the sales and relocation of numerous converting machines, sometimes under

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

▲A complete PCMC/TMC bathroom tissue/kitchen towel roll line supplied in 2019.

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/modernizations 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, 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 combined with the synergies of SERVIPAP exactly know their customer’s demands; they are capable to satisfy the needs and expectations of both sellers and buyers of used equipment. Their knowledge covers bathroom tissue and kitchen towel rewinders, industrial roll rewinders, napkin and pocket handkerchief machines, handtowel and facial tissue folder, packaging machinery, upgrades to existing lines and spare parts. For any request regarding used tissue converting equipment, TISSUE TEC Sales & Service GmbH and SERVIPAP are reliable partners 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. ●

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EUROMONITOR INTERNATIONAL

Retail tissue market will grow by 3% CAGR in volume between now and 2023 to reach over 28 million tonnes in 2023.

Svetlana Uduslivaia
Head of Research
Euromonitor International

For more information about Euromonitor International's full range of reports, visit www.euromonitor.com

New Tissue Forming Fabrics

Therefore, ANDRITZ Fabrics and Rolls has developed a new forming fabric portfolio with plain weave paper side structure and improved dimensional stability with the lowest caliper in the tissue market. With anticipation, the latest technology called QSB (Quattro Support Binder) can now be applied to this new tissue product line. The patented QSB forming fabric design allows producers to improve tissue product quality and machine performance. It has already been tested successfully at the new ANDRITZ Tissue Innovation and Application Center (TIAC) in Graz, Austria.

> “Increased **quality** and better running times”

Up to 15% better running times on the machine

The patented new tissue design, with its increased number of binding points, offers improved cross-dimensional fabric stability compared to conventional forming fabric designs. The result is reduced internal fabric wear and allows up to 15% longer running times on the machine.
The improved co-planarity and fabric stability lead to a significantly improved resistance to high pressure shower damage.
New monofilament material compositions and the re-engineered top fabric design reduce fabric wear and enhance energy-saving potentials.
Meanwhile, ANDRITZ QSB designs are operating

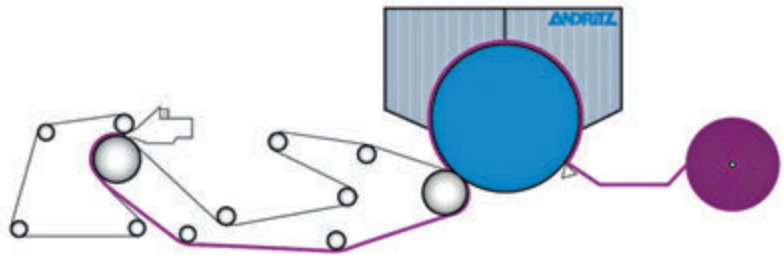
With the acquisition of Xerium by ANDRITZ, a new division in the ANDRITZ Pulp and Paper Service group named ANDRITZ Fabrics and Rolls has been formed, including former ANDRITZ Kufferath. Accordingly, ANDRITZ Fabrics and Rolls has always been the technology leader in tissue grade forming fabrics and is constantly investigating tissue market requirements. Quick draining, less water carrying forming fabrics are today the preferred products on modern tissue machines.

by: ANDRITZ AG

successfully in the graphic and packaging paper industries, with numerous installations providing added value to different customer processes. With the new plain weave structure, **ANDRITZ Fabrics and Rolls** has now complemented its market leading product series for tissue machine applications. Fabric calipers between 0.55 mm and 0.69 mm enable enhanced fabric surface characteristics with defined dewatering channels for better formation and an effective dewatering process during operation. Machine cleanliness is greatly improved with the application of thinner fabric calipers. ANDRITZ Fabrics and Rolls tissue product line including the patented QSB technology is available in 2:1 and 3:2 weft ratios for all tissue products and former designs.

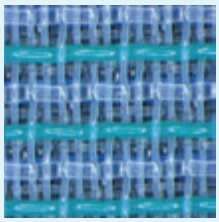
Andritz QSB design - Case Study

The following case study uses the example of a Crescent Former machine design, as shown below. Operating at 1,750 m/min, the machine has a design speed of up to 2,000 m/min. First results of the ANDRITZ 4-shaft QSB design in comparison with conventional SSB fabric designs used by a customer in the tissue market.



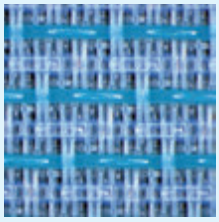
■ Crescent Former machine design.

▲Surface of plain weave 4-shaft ANDRITZ QSB design.

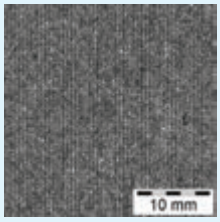


▲Underside of the patented 4-shaft ANDRITZ QSB design.

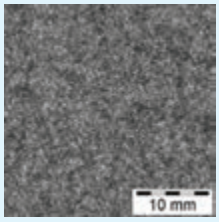
▲Surface of plain weave 8-shaft QSB design.



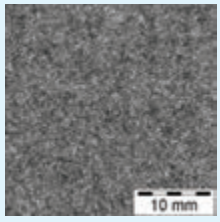
▲Underside of the patented ANDRITZ 8-shaft QSB design.



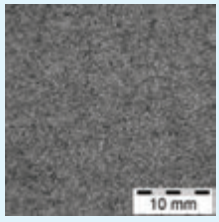
▲Conventional fabric design. Sample: 15 g/m² tissue (pulp + DIP). Speed: 1,750 m/min.



▲Conventional fabric design. Sample: 15.4 g/m² toilet tissue (virgin fiber pulp).



▲ANDRITZ 4-shaft design. Sample: 15.4 g/m² toilet tissue (100% virgin fiber pulp). Speed: 1,750 m/min.



▲ANDRITZ 4-shaft design. Sample: 16.4 g/m² toilet tissue (100% virgin fiber pulp). Speed: 1,900 m/min.

Machine data and former design

Former: Crescent Former Design speed: 2,000 m/min;
Product: Toilet tissue and other tissue grades;
Grammage: 15–22 g/m²;
Raw material: 100% virgin fiber pulp and mixed pulp+DIP.

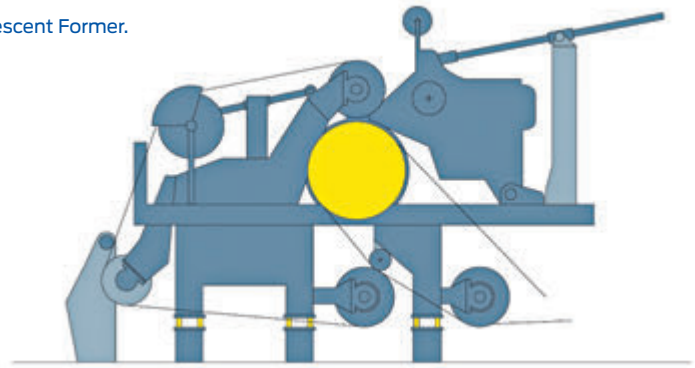
Forming fabrics:

- Conventional fabric designs;
- ANDRITZ 4-shaft QSB design.

Improvement targets:

1. Machine hygiene and performance;
2. Tissue formation and quality.

■ Crescent Former.



The paper tissue sample in the left-hand picture shows pin holes and strong marking. The toilet tissue sample on the right shows cloudy formation and diagonal markings. Formation improved significantly with the new ANDRITZ tissue forming fabric design. There is no marking visible on the tissue product with the new QSB design. The excellent fabric dewatering capabilities resulted in improved tissue product characteristics. This enabled stable production conditions at high machine speeds.

Summary

With the patented ANDRITZ QSB forming fabric design, both the tissue product quality and the machine performance can be improved.

ANDRITZ TISSUE FORMING FABRIC PARAMETERS	QSB 4-SHAFT DESIGN
Machine-side weft diameter [mm]	0.25
Air permeability [CFM]	520 - 560
Calipers [mm]	0.60
Fiber support index	173 - 168
Support points/cm²	1,229 - 1,170

Proven features: High dewatering capabilities (air permeability and low fabric calipers); Improved tissue quality (FSI >165); Clean run and no water spray at high tissue machine speeds; Improved cross-dimensional fabric stability for consistent machine operating conditions during the entire running cycle (6 months). ●

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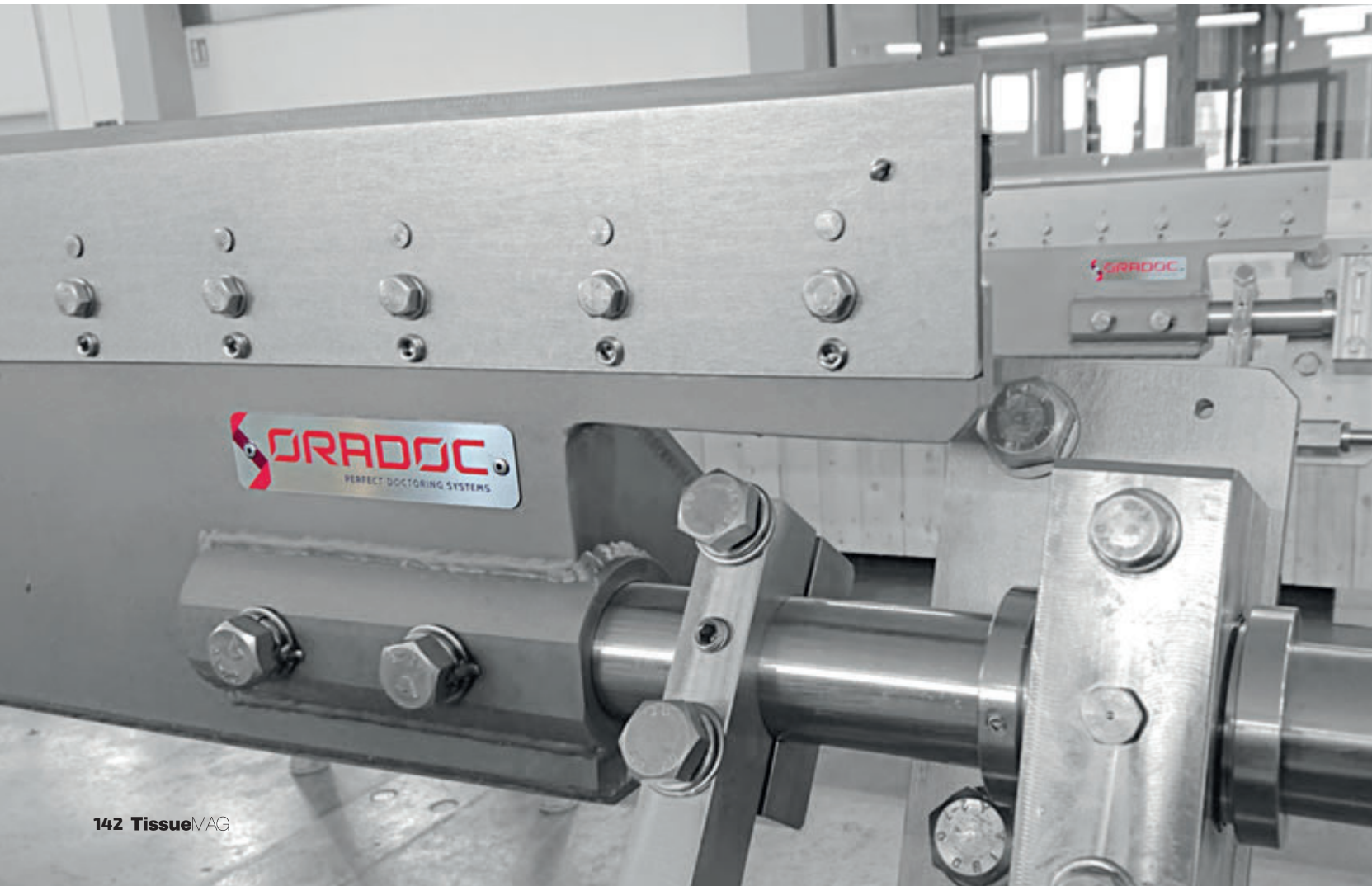
ORADOC and EINTEC: pushing business in India one step forward

by: Sara Giunchi, Oradoc Communications & Marketing Manager



▶ EINTEC group at Paperex 2017 - in the first line, third from the left is Mr. Vijay Singhal and fifth from the left Mr. LS Meyappan, the two EINTEC's partners.

According to data collected and released by the Indian Paper Manufacturers Association (IPMA) and the Indian Pulp & Paper Technical Association (IPPTA), the Indian paper industry accounts for about 3.7% of the world's production of paper; the estimated turnover of the industry is approximately USD 8.5 billion and it provides employment to more than 0.5 million people directly and 1.5 million people indirectly. Currently, the mills use a variety of raw material such as wood, which accounts for 25% approx. of the total production share, recycled fiber (58%), as well as agro-residues like bagasse, wheat straw and rice husk (17%). The per capita paper consumption in India slightly exceeds 13 kg, far behind the global average of 57 kg. Within the paper industry, the tissue segment is emerging as well, and enjoying an exciting scenario: India is the fastest growing market for paper globally, and along with the economic growth, increasing consumer awareness and disposable income, tissue consumption is destined to grow by leaps and bounds in the upcoming years.
With more than 1,000 mills - of which about 750 operational - the Indian paper industry is highly fragmented. Top 3 players account for only 9% of the market: writing and printing paper and paperboard are the two largest and most profitable segments in the sector, with ITC (4.1% market share), JK Paper (2.6%) and Tamilnadu Newsprint And Papers Limited (2.4%). Most of the paper mills are in existence for a long time and hence present technologies fall in a wide spectrum ranging from oldest to the most modern, with production machine of many different dimensions running at different speeds.
Thanks to the long-standing partnership with EINTEC, dating back to the early 90's, **Oradoc** has its share in the Indian paper and tissue market. **EINTEC** is specialized in pulp and paper industry, serving customers in India, Bangladesh, Nepal SriLanka and Gulf Cooperation Council (United Arab Emirates, Kingdom of Saudi Arabia, Kuwait, Oman, Bahrain and Qatar). Since its inception in 2006, EINTEC is at the forefront in offering the best available products from world's leading suppliers from Europe and has established

> "Oradoc's **expertise** has grown together with the **partnerships** of its customers"

the credentials with the customers as well as the principals. Mr. L.S. Meyappan and Mr. Vijay Singhal, the two partners, have put in more than two decades of experience in engineering and trading activities before venturing on their own; the company has now offices in Delhi, Coimbatore and a liaison office in Dhaka. With "EIN" indicating number '1' and color orange of the company logo representing ambition, efficiency and endurance. EINTEC believes in trading through excellence and be a well-recognized supplier to the pulp and paper industry.

The Indian market is large and appealing enough to catalyze the attention of many Eastern suppliers that make competition very tight, lowering prices and margins to the limit, but thanks to EINTEC's well established and in-depth knowledge of the market, the trustable relationships built over time with Indian paper and tissue major players, the understanding of their plants' products and needs, Oradoc has managed to consolidate its market share in the country.

Be it the revamping of a paper or tissue line, or new machineries or machine parts, Oradoc has been making business with Indian OEM and end users for the last 30 years, also offering after-sales services such as supervision on installation or spare parts. When it comes to complete doctoring solutions for the paperboard industry, OraClean and OraFlex are the two types of doctoring systems that definitely meet the needs of such production lines, for example in wet-end or dryer section. In many other cases, instead, only new blade holders are often required to replace obsolete or not performing ones. Dewatering solutions for presses are also an important Oradoc installation in many plants, as they help improve the dry percentage of paper, thus optimizing energy consumption.

OraFlex and OraTwin are the most important Oradoc products to be installed in this position, along with save-all tray. Apart from occasional commercial visits to customers, once every two years Oradoc always attends Paperex, an internationally renowned series of exhibitions and conferences focusing on paper, pulp and all related industries. It is the only comprehensive business platform serving the paper industry

■ OraTwin destined to an important Indian customer.

> "Oradoc offers **high performing solutions** for cutting, cleaning and creping"

and showcasing the entire spectrum of products and services relating to the paper and allied industries. This year, the 14th edition will take place from 3rd to 6th December as usual in New Delhi. At EINTEC's booth, Oradoc is not going to miss the occasion to network, source, share knowledge and joint ventures with major players coming from across the globe, always a step forward to foresee and meet the needs of the paper and tissue industries. ●

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BINET SUL LIRI

Striker: high performance felts for crescent former machines

A Crescent Former machine felt is definitely a very complex product that requires great precision both in design and manufacturing.

by: Binet sul Liri SpA

> “Our sales have **persistently increased** on an average rate of **15% per year** within a highly competitive market”

▲ Binet sul Liri Mill in Isola del Liri Italy.

Besides being a single felt like the traditional Pick-up, in fact, it also performs a forming function for the paper sheet, receiving a huge amount of water in addition that will essentially dispose by centrifugation through the forming fabric that wraps externally the felt in correspondence to the Forming Roll.
The dry content after the landing on the felt is only 0.2%, meanwhile after centrifugation through the forming fabric, the dry content of the paper sheet is 12%, therefore, at the formation, a 16 g/m_2 sheet loses a quantity of water equal to 7,866 g/m_2.
Like all felts for tissue machines, it must therefore be featured by: a fast start-up (24-48 h); low thermic and electrical consumption; an acceptable duration (30-60 gg). The quality and quantity of the production are directly linked to the felt and therefore to its performances, both at the press suction area and in the Nip area.
From our knowledge it turns out that just 1 g/m_2 more of water in the sheet is enough to lose 1% dry and 4% speed, to say 72 m/min for a machine running at 1,800 m/min.
The initiation of the project for such a felt should start from the acquaintance of the airflow which is sucked by the suction press. It should also take into account the air characteristics, i.e. temperature and humidity of the air intake. In fact a hot and dry air is much more effective, from the point of view of dehydration of a cold, moist air. In this regard there is the study of the systems to suck instead of ambient air, a preheated air conveyed in front of the suction zone of the press from particular boxes, as the old steam boxes.
As said, it is important to know the capacity of the pump connected to the suction press.
In fact, it will be the air molecules that cross the sheet + felt sandwich to get loaded with the water that they come across along their way and they will load as much as they can hold.
So, how much more air we can withdraw through the Felt, greater is its hygroscopicity and greater will be the sheet dryness at the ingoing side of the pressing area, and at the exit of the Nip, thanks to a lower rewetting as a consequence of a drier felt.
Obviously, the amount of air extracted is often a fixed parameter for each machine and as well tending downwards due to the high energy costs associated to the engines of the pumps that can be estimated approx. 500 €/year/Kw installed and 1.0-1.5 Kw/m_3/min of vacuumed air.
Consequently, the felt is asked to take charge of the "transformation" of the air quality in order to make rather insignificant molecules from a hygroscopic point of view, become extraordinary moisture "eaters". Transformation will be carried out by the so-called "Vacuum". And the vacuum is produced by the felt structure that determines a loss of charge of air flow when it is crossed by this.

◀ Heatsetting of a base fabric.

▲ Weaving loom for tissue felts at Binet sul Liri SpA.

This loss of charge is directly proportional to the specific surface of the fibres (finer fibers, greater specific surface), to the thickness of the felt, to the speed of the flow and, in reverse, proportional to the open area of the various layers of the felt.
The equation that describes the loss of load of a fluid in a porous medium is the equation of Darcy, reshaped for modern needled felts in the Kozeny equation:

$$\Delta P = z * 2.25 * K * M * V * S * (1-\varepsilon)\ 2/g * \varepsilon 3$$

where K (Kozeny constant) is a constant value without dimensions that represents the tortuosity of the capillaries that has variable values, from 3 to 6, g is the well-known force-mass conversion factor, ε is the empty fraction of the felt element. S is the specific surface of the fibres and can be calculated with the following expression:

$$S = 4 * d/d2$$

where d is the diameter of the fibers that compose the Batt.

Felt engineering: tech support

All these complex equations must be applied to each layer of batt in order to subsequently rebuild the total load loss and from this the permeability of the felt in the canonical CFM.
Obviously, this is practically possible only with the use of a specific software known as our FELT ENGINEERING® at present exclusively owned by **Binet sul Liri**. Returning to the molecules of the air, these, thanks to the resistance encountered in the crossing of the felt and the consequent depression that is generated, compared to the atmospheric pressure, they dilate increasing their hygroscopic capacity by loading the water deposited between the sheet and felt fibers to the passage. The physical law describing the phenomenon is Boyle's law, enungated for perfect gases, but it is valid with good approximation also for air, so at constant temperature.

$$P1 * V1 = P2 * V2$$

from which

$$V2 = P1 * V1/P2$$

If P1 = 1 atm and P2 = 0.5 atm we will have that

$$V2 = 2 * V1$$

That is, with a vacuum of 0.5 atm = 5 m of water column, the volume of the air molecule doubles its volume and if its relative humidity was in the typically humid environment of the paper mill of 70-80%, becomes of 35-40% and therefore highly hygroscopic.
This is the reason why a low vacuum does not take water away, simply because the air molecules are not sufficiently hygroscopic. ●

▼ Eng. Marco Viscogliosi, General Manager Binet sul Liri SpA.

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Happy Birthday

The Pulsar Group is 30 years old and for this special occasion has decided to show everybody its growth over the past few years, presenting worldwide its products and its most recent development during open house events taking place in Italy, twice in North America, South America and Asia. These events are focused on "Industry 4.0" applied to the Tissue Paper sector, specifically on the new technologies and upgrades engineered by the team.

by: Pulsar Engineering Srl

Pulsar is a company that produces specialized automatic machines for the Tissue sector, which include machines for handling, packaging and sorting rolls and packs for toilet paper and towels, machinery for processing and packaging of folded products, product handling units and machinery with special software for quality control. In a few years, Pulsar has built more than 420 systems and twenty-four complete systems for the major tissue producers.

Quatis

During It'sTissue 2015, Pulsar launched for the very first time Quatis, a quality inspection system. Quatis has been the first system available for the Tissue Paper sector for the automated quality inspection of products. These machines can collect a large amount of data in real time and inform handlers of issues with the product or machine, allowing them to fix problems

▶ Quality inspection machine for folded products.

Pulsar Group

“Pulsar Engineering has installed **turnkey plants for the main tissue producers** all around the world”

■ **Roadmap of celebrations for the 30 years of Pulsar Group.**

> Engineering, production and creation of movimentation and transport solutions for **packaging** and **tissue**

▲ Mr. Sol Sonnenschein, the new Sales Director of Pulsar America.

PULSAR ENGINEERING SRL

Via Marino Serenari 29 40013 Castel Maggiore (BO) - Italy

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quickly and efficiently. The first results are the reduction of the amount of non-compliant products and jams in the machinery, and consequently the increased efficiency considering same operators number, working hours and equipment. Quatis machines can be connected directly to the company ERP network, to which they will transfer the information about the quality obtained. The connection allows a detailed statistical analysis about the type, the frequency and intensity of non-compliances detected, the frequency and intensity and associates them to the working conditions of the upstream machines. Moreover, through the collection of quality data related to production lots, customers have the opportunity to benefit from a unique traceability system which guarantees the quality of the supply to the final customers and manage the possible after-sales disputes.
Pulsar Engineering provides also its customers with a remote service of data collection, analysis and interpretation, sending periodical reports based on a daily, shift or lot basis, if the user is not equipped with the necessary tools to perform the analysis independently. Every little step lead to a more integrated plant, which leads customers to an improved efficiency and productivity, reducing costs and lost.

Worldwide events

Some info about the last events hold in October. The celebrations started during TissueCon 2019 at the Gaylord Palms Resort and Convention Center in Orlando, FL - USA, October 1-4. During this exhibition, Pulsar America Inc. presented its new team organization, with the recruitment of Mr. Sol Sonnenschein as Sales Director and Mr. Jason Jones as Costumer Service Resident Engineer. Sol, taking on this new position, will be leading the North-American office, joining Massimo Capisani, VP Operations in the management of the US branch while Jason, with his experience and skills, will enhance the local customer service on the area managed by the organization.
At TissueCon 2019, participants had the opportunity to hear Sol talking about how Industry 4.0 can affect the tissue paper industry with a presentation called "Quatis Machines: A Perfect Match Between Quality of Products and Efficiency of the Whole Line". Industry 4.0 has been the lead topic for the Pulsar Group in studying and engineering new equipment and related services.
Next, in Italy Pulsar Engineering attended the 26th edition of MIAC in Lucca, October 9-11. During the whole week of the exhibition from October 7th to 11th, the Group decided to host an open house.
Then, the celebrations continued with an open house in Shanghai from October 14th to 18th, where Pulsar Engineering opened a new sales office with a dedicated demo room last July. Lion Li, General Manager and Sales Representative for the Chinese market, welcomed guests for showing and testing brand new equipment specifically developed for the Asian market.
After that, from October 21st to 26th they transfered to South America where local costumer had the opportunity to see the technology.
The last event of the month of celebrations took place in North America, more specifically in Pulsar America premises, in Green Bay, WI.
The open house was 2 weeks long from October 21st to November 1st for customers to see the offices and to meet the staff. ●

With 300 sold devices worldwide, it is clear the tissue industry speaks TSA!

Challenges are won together

▼Electrical Cabinet for a system integration with Sael Drives.

The paper market is a demanding, exciting and truly complex world. Technical challenges to fulfill different manufacturing needs every day.

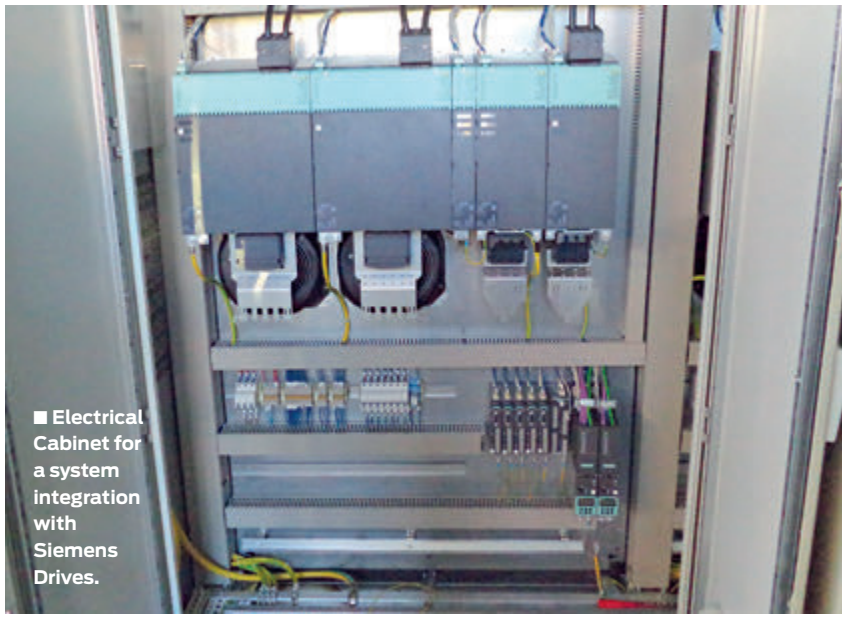
by: SAEL Srl

SINERGY
a Company of Sael group

▶ Electrical Cabinet for a system integration with ABB Drives.

Over the last years the automation systems manufacturing went through several transformations: new individual or small companies were born; several bankruptcies, few acquisitions, merges and so on. The main driver of those changes is one as well as the above titled sentence: "Technical challenges to fulfill different manufacturing needs every day".
The national and international paper and t.n.t. manufacturers had to fight - and still have to fight - against the Asiatic powerful aggression. This caused a migration to the high quality and special paper nice markets, even extremely cost sensitive.
The production of those special papers requires high technical skills and qualified workers. All in all, is based on a masterly mix of mechanic and electronic system: a mix of "power" and "accuracy".
The automation control system is the real plus who allows any paper manufacturer to play the difference in a competitive market. Today, all of that, has a solid replay: SINERGY-SL.
Born from the association of historical and experienced system automation players, **SINERGY-SL** offers a complete turn-a-key solution to the customers. Engineering, Manufacturing, Commissioning of Automation controls and electrical cabinets for the paper industry and more...

> "**Custom** and **flexible solutions** for easier and quick installations: systems and friendly user interfaces for any production stage"



■ Electrical Cabinet for a system integration with Siemens Drives.

> “Since 1987 SAEL develops **integrated systems** and **process controls solution** for industrial automation”

A dynamic team of experts, competent and flexible, highly skilled on build new machines as well as revamping of existing solutions. A wide specialization as: MCC, PCC, DCS, QCS up to the ending-line. Use of own drives - ONE Intelliflex Platform: ac/ac and dc/ac full digital inverters; air and liquid cooled, up to 1 MW and more with parallels - as well as most common drives available on the market like Siemens, Abb, AB etc... Am own, and open, SCADA; or PC Siemens S7 and others.

SINERGY-SL supports the customer from the very beginning of the project, the engineering, the automation, through the electrical equipment and cabinets, till the commissioning.

SINERGY-SL is a unique responsible company for the customer. An umbrella of expert companies who belong to.

Beside the big majors, SINERGY-SL is the only one who possesses and owns drive technology; an own system automation: the only one who can fulfil any specific need at competitive price.

SINERGY-SL is a solid face, with well known somatic: SAEL; ELETTRONICA LUCENSE and SIMI&C. Three different Companies in terms of sizes and specializations, very strong and skilled. A solid rock of this dna.

A TEAM TO BE CHALLENGED. ●

■ Electrical Cabinet for a system integration with Allen Bradley - RockWell Drives.

SAEL SRL

Via Dei Genieri 31 36040 Torri di Quartesolo (VI) - Italy

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INDEXA
COMPANY

FROM **ENGINEERING** TO **TURN-KEY** PLANT

www.indexacompany.com

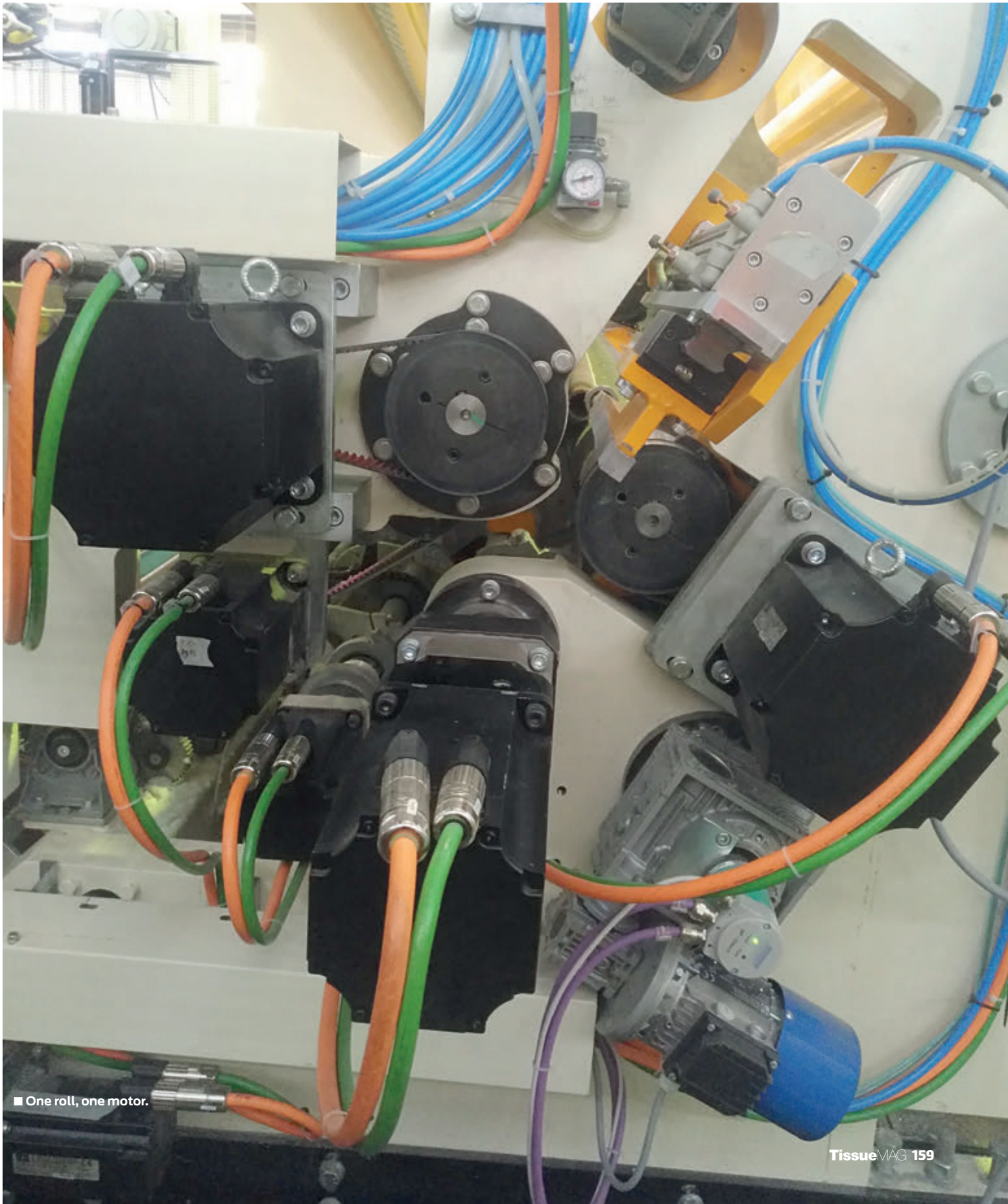
AirEvo, the mechatronic tailor is born

It just so happened that we were looking for solutions to production problems by looking at existing machines or procedures but, we were often left with unsatisfactory results. And then one day it hit us: what if we look for a "tailor" who builds customised machines or solutions? This is how AirEvo was born, an industrial roll machine centred around the customer's production needs.

by: AFD Antica Fabbrica Digitale Srls

▲AirEvo inside.

It all started with a request from Lorenzo Riva, the general manager of Eurocarta, to modernise an old line. So, we all sat down together at a table: us at **AFD**, Damiano and Graziano Giannini from OMT, the Eurocarta technicians and their director. By the end of the meeting, it had been decided that a new rewinder would be built, with the aim of creating a machine that would solve Eurocarta's production problems.
First, an operating principle was chosen that would provide a changeover guarantee. Thus, an application was submitted for an OMT patent, which allowed a reliable and simple transfer to be calibrated and configured.
We then focused on extreme speed and simplicity for changing the production type. Tooling adjustments were made without carrying out any mechanical interventions on the machine: the core diameter was changed from 25 mm to 90 mm without having to modify the mechanics (solely by altering the parameters on the operator panel) and the perforation length was electronically adjusted from 200 mm to 400 mm without replacing the blades or pulleys. A motor was fitted to each roller: this ensured absolute tension and



■ One roll, one motor.

■ AirEvo running.

> “We are not just a **technology supplier**. We listen to and implement the ideas of entrepreneurs that are looking ahead”

paper formation control. Given the types of motors used, substantial energy savings were also achieved. We then equipped the machine with strong, heavy-duty “foundations”, by choosing 80 mm-thick plates for the sides of the machine.
We chose CMZ’s FCT300 with the CODESYS platform for the electronics; it controls 12 axes via cam or electric shaft. The choice of CODESYS, combined with CMZ’s reliability and expertise in axis management, has allowed us to integrate devices from different manufacturers into the system, by assessing their reliability, quality and availability, without necessarily being tied to a single supplier.

The AirEvo creation

During the construction phase, which involved ongoing discussions between our technicians and those at Eurocarta and OMT, further technical changes were made to better comply with the customer’s needs. For example, an additional procedure was added to the tail sealing gluer to bind the rolls and a spray glue system was added instead of the roller system, in order to use less adhesive.
This collaboration has led to the creation of AirEvo: an exclusive machine characterised by changeover times that have been practically reduced to zero, an electric energy consumption with a cruising speed of 10 kW (less than the energy used for the motor to rotate an industrial roll cutting disc), an ergonomic easy-to-use operator panel, a roll changeover that works even if you forget to insert or misplace the perforator, and glue on the cores. There is a very important final detail: as the Eurocarta technicians participated in the project from its development right up to the commissioning phase, they can easily carry out all the maintenance work on the AirEvo without having to use external technicians. In practice, we have created a “mechatronics tailor”, where the customer has not had to adapt to the needs of machinery as the machine itself has adapted to those of the customer.
A “tailor” that is very fitting with the words of the great irish playwright, George Bernard Shaw: Shaw’s tailor was the only man who took his measurements every time he saw him, whereas all the others kept the old measurements and expected him to fit them. The concept of Shaw’s “miraculous” tailor has been used in “mechatronics” to create the AirEvo: it is the machine that takes the measurements to adapt wonderfully to the customer. ●

▼The operator panel.

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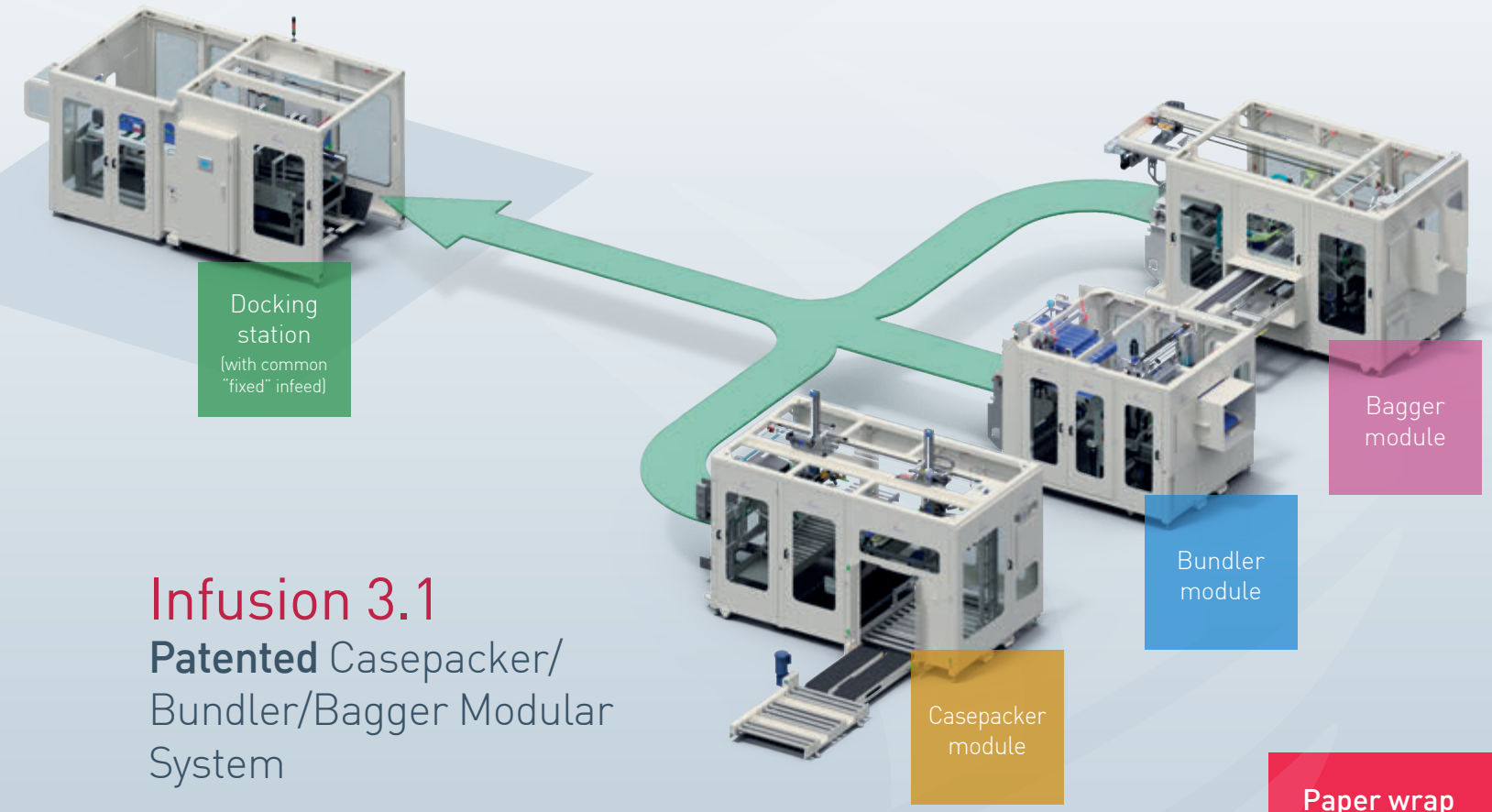

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Effectively solving tissue production, converting and packaging problems using event capturing camera systems

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

▲ 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.

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 has been fully integrated into the process of 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:

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.

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.

▲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.

"Papertech is the **Vision technology** vendor of choice for industry leaders in Paper Production in the World"

▲Multiple cameras views showing defects.

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.

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 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 restore operator-machine visibility, and 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. ●

member of IBS PAPER PERFORMANCE GROUP

▼High resolution camera.

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AZMEC is always looking for the discovering

of a better and improved product

Azmec is projecting and producing machines that grant an excellent quality together with high performances even in very hard working conditions. Offers vacuum pumps of various dimensions to grant the customer a wide range of machines working at different levels of energy consumptions.

by: Azmec Srl

The skill and the experience consolidated in almost 60 years of presence in the market (AZMEC was founded in 1960) say that AZMEC is a serious and available partner for all the companies of the paper mill industry that have to optimize the performances of their own vacuum plant, a main part of the paper machine; AZMEC is not only proposing its own solutions in new vacuum plants but allows the customers, through its overhauling service, to rebuild old pumps working for many years, to the original performances with an accurate revamping operation. The production includes six lines of vacuum pumps, machines available to grant capacities from 150 up to 50,000 m³/h. Together with the vacuum pumps, **AZMEC** offers 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 capacity interval from 150 to 12,500 m³/h; the range ALBV/2000 covers capacities from 2,000 to 7,500 m³/h and the characteristic of these pumps is to have practically two pumps in one due to the presence of a divider that creates two sections each 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 that have the same range of capacities of the range AL/2000; with the size ALCZ, pumps available to work without and with

▲ Vacuum pump groups AL22.

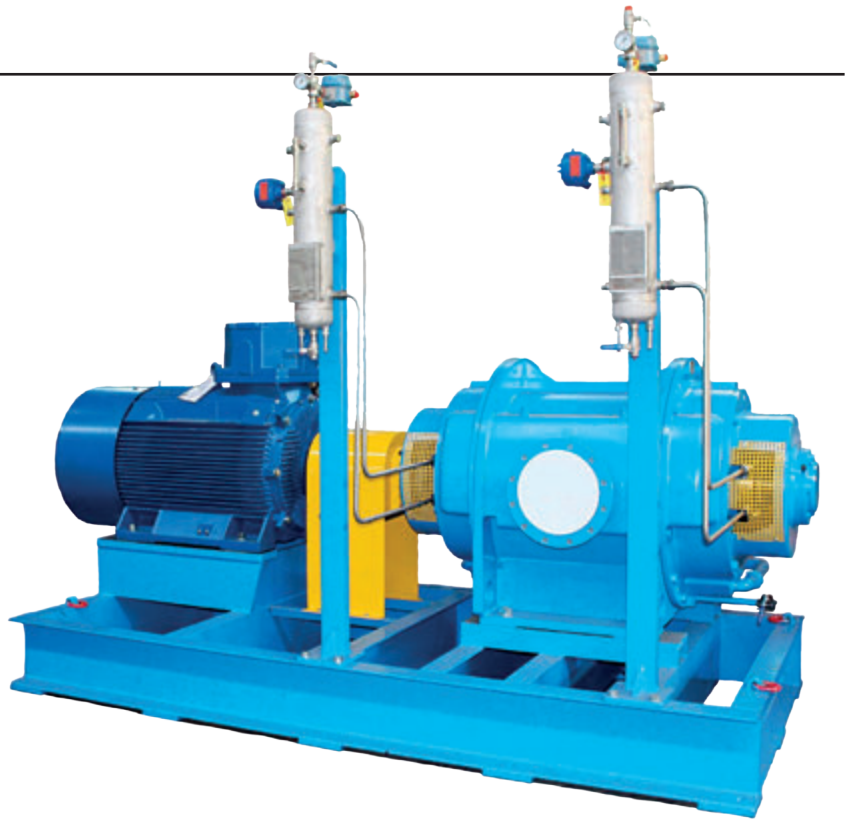
the divider, the capacities reach the maximum of 50,000 m³/h; the range ALBC grants capacities from 450 up to 17,000 m³/h and the range ALB4 grants capacities from 4,500 up to 21,000 m³/h.

A complete service for the best arrangement of the vacuum plant

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 environment; to get the best solution, the company offers the customers the covering of the pumps with soundproof panels available to reduce the noise level to 75 dB(A). Clearly these solutions can be applied also on machines already installed. The proposal is not only concerned to the supply of its own machines; AZMEC is also offering the customers a complete service for the best arrangement of the vacuum plant; usually it is preparing a lay-out of the vacuum plant arranged according to space necessity and to customer installation just to optimize everything both from a technical view and a logistic view just not to have problems in case of maintenance.
Just to go inside the maintenance, AZMEC not only

> “Azmec satisfies **all the necessities of its customers** arranging engineered groups complete with products and accessories of high quality, according to the technical requirements”

> Azmec is specialized in the production of **liquid ring vacuum pumps** and mechanical workings for external companies



overhauls its own machines but also the pumps of competitors; 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 supplies the customers a spare pump so that the production has not to be stopped during the repairing of the pump. It's important to mention the last and very important supplies made recently by AZMEC: A2A GENCOGAS n.1 turn key solution skid AL75/2000 with soundproof cabin (Chivasso Plant), FLSMIDTH MILANO n.3 vacuum skid AL40/2000 in AISI316 with soundproof cabin, GAPCON TISSUE n.5 ALC420Z pumps + n.1 ALC400Z (final destination Indonesia and Bolivia), TECNIMONT SPA n.3 vacuum skid ALN64/2003 totally in AISI316 with mechanical seals and API681 execution (final destination The Netherlands), ATLANTUM n.10 vacuum groups ALC420Z (final destination Belarus), ANDRITZ n.2 vacuum pumps ALC670Z and n.1 vacuum group ALC500Z (final destination Russia). The production is arranged in two workshops: Arenzano (GE) and Verderio (LC). The vacuum pumps are manufactured through the use of CNC tool machines and tested in the 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 on the consolidated quality of its own products and to the efficiency of its staff. ●

▲ Vacuum pump groups ALN68 TM ATEX.

▼ Vacuum pump group ALC500Z and ALC506Z.

AZMEC SRL

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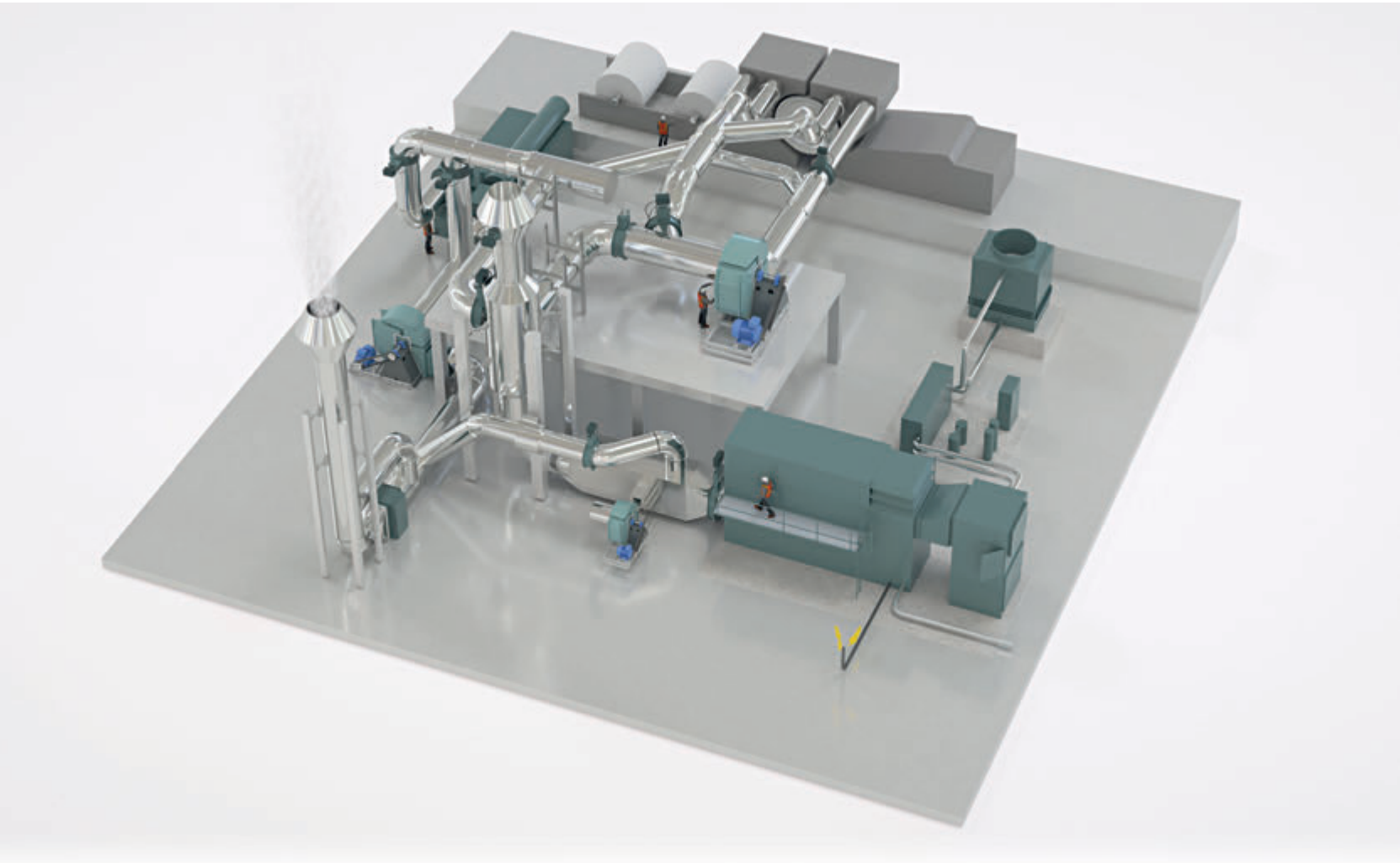
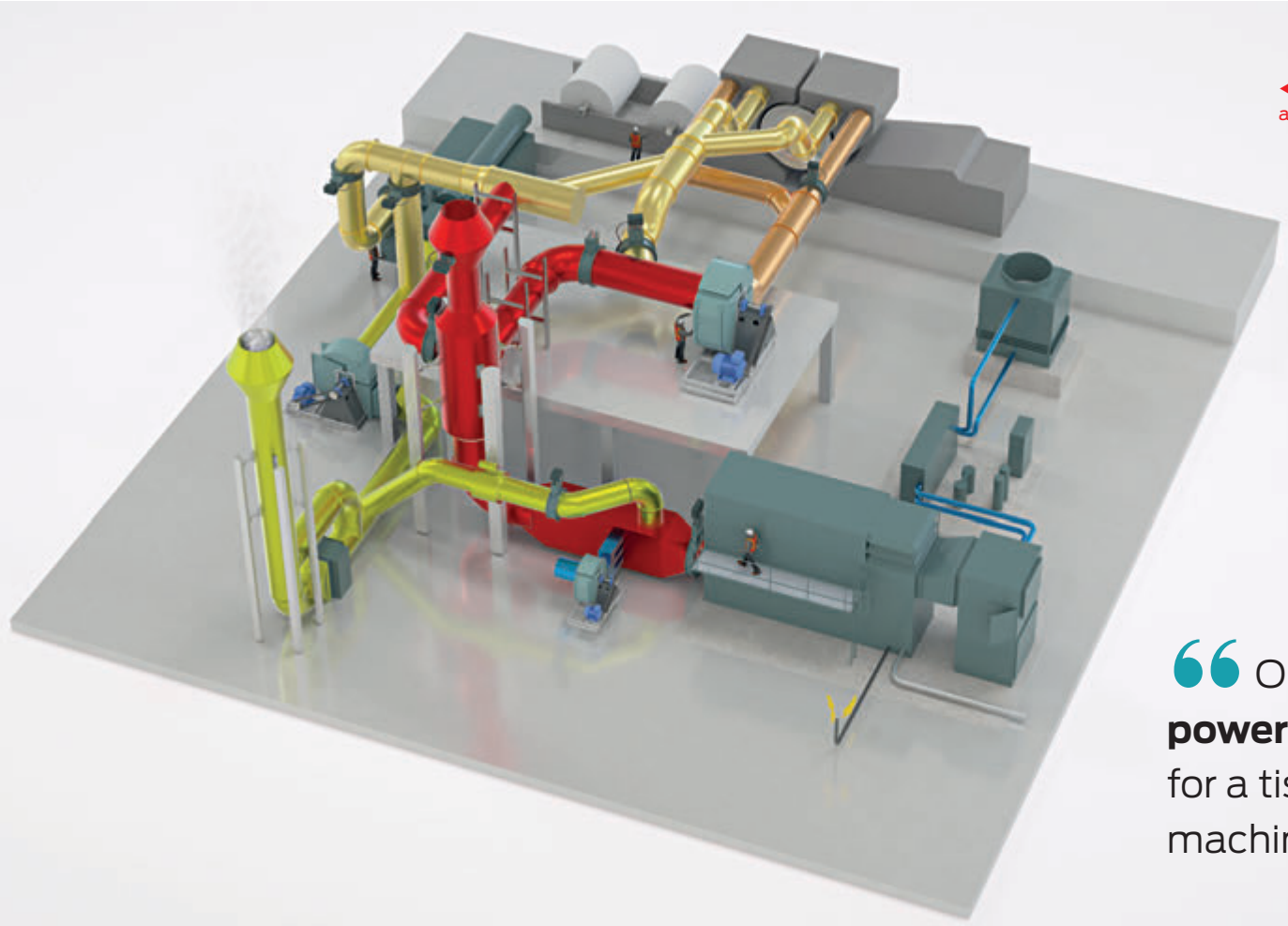


Revolutionizing the world of energy with REENERGY+



◀ Reenergy+ plant at post combustion.

> “Only one **power source** for a tissue machine”

EIL confirms, redesigns and revolutionizes the world of energy with REENERGY+ at post-combustion, reducing the energy impact of production by 38% and emissions by over 80%.

by: EIL

Today, it is possible to go beyond the concept of energy thanks to REENERGY+, the new EIL department entirely managed by internal personnel for assistance and maintenance on turbines, and air system and steam balancing.

The new concept is based on the use of an ultra-modern post-combustor that acts as energy modulator with impressive benefits, actually eliminating traditional burners.

The new air system will hence no longer feature burners and related plants, fans, air supply ducts and gas pipes; everything becomes simpler and safer since it will be free of areas at risk of fire. The post-combustor guarantees full operation also in the event of unavailability of the turbine, but the true, extraordinary result is obtained by its operation in synergy with the turbine:

- 10% less consumption;
- +15% total efficiency.

A further demonstration of its use in view of concrete sustainability is the development by EIL, in collaboration with international partners, of an innovative system capable of converting paper mill sludge into syngas, used inside the turbine. The plant will be illustrated and presented by the end of the year at EMEX, London. With its new REENERGY+ brand, EIL launches on the market a veritable revolution in the realm of energy. A revolution that

■ EIL technical assistance.

can be applied to any machine for paper production (tissue and board). In a market where energy costs and environmental constraints carry such importance, REENERGY+ is the complete solution, perfectly integrated in the production cycle. **EIL** develops the entire project internally with no exclusions, relieving the customer of any burden up to the project's completion. The patented software guarantees a unique flexibility because it affords modulation and complete management of the gas turbine as well as of the entire production, without requiring additional specialised staff and without interfering with production.
REENERGY+ is integrated as an alternative and back-up burner that combines hot air generation and the production of electricity, a process completely independent from production that can be disabled at any time without stopping the machine. The hot air is stored and managed through a sophisticated, totally automatic system that can be modelled based on machine requirements, exploiting its potential to the fullest. The air obtained is much drier and cleaner compared to traditional combustion. Energy production comes from the OP16 gas turbine marked Opra (for plants up to 90 tons/day) and Siemens or Centrax (for plants from 90 to 200 tons/day) of which EIL is world partner for the paper industry. The guaranteed benefits are:

- 8,500 hours per year of continuous operation;
- 1 annual 5-day maintenance intervention;
- very low and all-inclusive maintenance costs;
- from 1,750 to 16 Mw produced in any outside weather conditions;
- 80% reduction of pollutants at the end of the cycle;
- 10% increase in production;
- enhanced paper softness;
- annual TEE (energy efficiency certificate);
- no noise impact;
- no increase in gas consumption;
- 10-year warranty with no decrease in performance.

The system is monitored 24/7 by the team of specialised technicians at the EIL facilities and is activated with on-site assistance in the event of failures. An internal department dedicated exclusively to REENERGY+ ensures full support in the event of problems, relieving the facility of any burden and ensuring electrothermal production 360 days a year.
And last but not least, EIL completes its services with the possibility of wholly financing the plant. After an important test period during which the related environmental, performance and flexibility assessments were performed, REENERGY+ is today marketed in every country through a dedicated sales network. In parallel with the energy efficiency plants, EIL provided total electrification on 7 tissue machines in 2019, 3 Reenergy+ plants, and in 2020 it will inaugurate an additional department dedicated to end-of-line robotic stations for converting.
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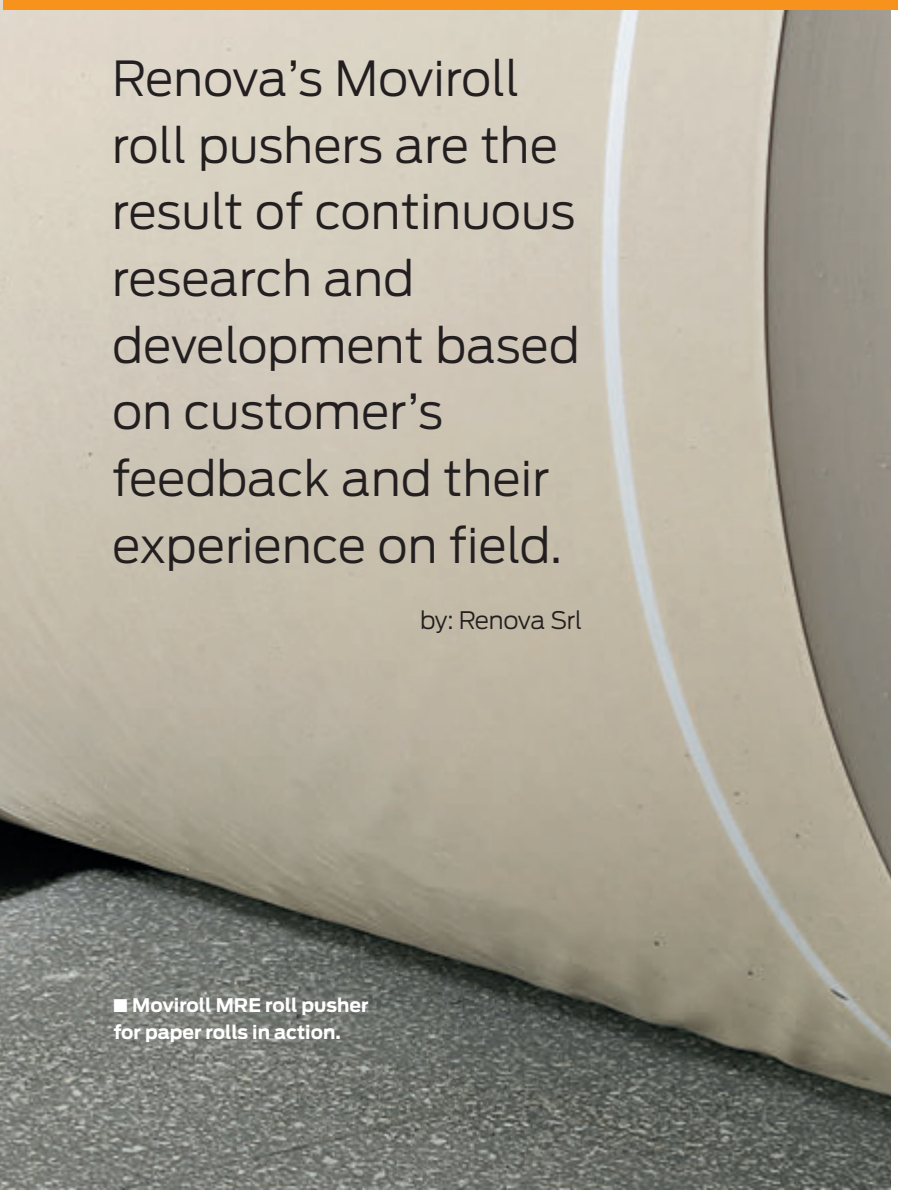
MOVIROLL, Renova's roll pushers

Renova's Moviroll roll pushers are the result of continuous research and development based on customer's feedback and their experience on field.

by: Renova Srl



■ Moviroll MRE roll pusher for paper rolls in action.

Every year a wider range of models plus a range of optionals and accessories are available, all of them designed, manufactured and assembled on site at Renova, Italy. This allows us to quickly work at competitive prices and to be able to support our customers with personalized projects.

Same power, different design models

All application needs are different. For this reason, **Renova** offers different design models of battery powered roll pushers for the handling of paper rolls and tissue paper rolls: MRE, MRE LP and MRE LPT, which are also available with several handle configurations to meet any operator requirements. They ensure a thrust force of up to 20,000 kg (44,100 lbs) and a maximum lift force of 5,000 kg (11,000 lbs).

Higher performance, longer life service

Customers reported problems of pour performance of their battery roll pushers - compared to pneumatically driven models - and short-term battery charge.

> "Values, passion and dedication, combined with a zeal for **experimentation** and **innovation**"

Instead, Renova's Moviroll battery systems ensure very high and long performance to the complete satisfaction of users. This is possible thanks to their heavy-duty, but compact and handy design, and the high quality 24 V lithium battery, which powers the 24 V DC IP 44 motor. In fact, the Moviroll battery roll pushers ensures the operator to move from 60 to 120 rolls with only one battery charge, equal to 3-5 shifts. Lithium battery life span is numerable to 500 recharges and recharging the battery does not take more than 4 hours. They are provided with a second battery.
The Plug & Play batteries allow quick changes of the battery (in less than 10 seconds) without interruptions during operations. Moviroll battery roll pushers are 100% designed to last and no maintenance is required. A 24-month warranty is applied to the whole system. 1-year warranty is also applied to the battery.

Higher safety level

Moviroll means higher safety level in plant as it prevents injuries by helping the operator to easily and effortlessly move paper rolls across the plant with no more forklift track needed close to the corrugator line.
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. ●

▶ MRE model for paper rolls.

▲ MRE LPT model for tissue paper rolls.

▶ MRE LP model for paper rolls.

“Renova: from 1960 a story from Italy. **Pneumatic brakes** and **web tension control systems**”

■ Moviroll roll pusher in the plant.

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Have the trade regulations between US and China impact on the tissue industry?

by: Lei Wang, Pirkko Petäjä and Mikko Helin,
Pöyry Management Consulting

US-China trade war

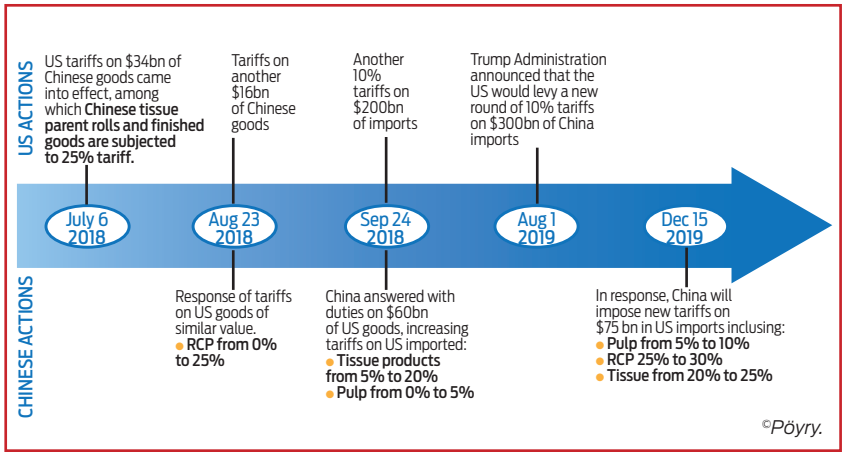
Since January 2018, the world's two largest economies, the US and China, have been on a trade war. Numerous tariffs and restrictions have been imposed on goods traded between the two countries including pulp & paper products. Figure 1 presents the chronology of US-China war related to the wood pulp, RCP and tissue products. At this stage, it's not easy to evaluate the exact impact of the trade war on the paper and board (P&B) industry, but it seems that the Chinese P&B industry has taken a bigger hit than the industry in the US. 2018 turned out to be very disappointing for the P&B industry in China. According to China Paper Association the total P&B demand declined by -4% comparing to 2017 and the production declined even further, by -6%. In comparison, for the last decade before the trade war in 2018, the P&B industry in China was growing at roughly +4% per year. However, according to the China Household Paper Industry Association (CNHPIA) tissue demand was fortunately still growing, increasing from 8.5 million ton in 2017 to 8.9 million ton in 2018 at +4.5%. It may appear to be rather good growth but when comparing to the CAGR of 8% in the past decade, the growth has slowed down substantially. In the US side, the trade war seems to have had a minor impact on the P&B market. The P&B demand in 2018 continued the stagnation trend since 2012. Tissue consumption grew marginally by 67 thousand ton totaling 7.1 million tons in 2018. If one moves the focus to international tissue trade, it's not difficult to anticipate that the tissue trade between the two countries will be negatively influenced particularly concerning the escalating tension.

Summary

2019 will continue to be a turbulent year for both the US and Chinese tissue producers. The uncertainties caused by the trade war and RCP ban in the fibre supply end will continue to affect tissue producers. However, it seems that the US tissue producers will benefit from the situation. Both the trade war and RCP ban will result in surplus fiber supply in the US domestic market meaning fiercer price competition which is in favor of the tissue producers. Low RCP prices will benefit particularly the AfH and private label segments. The same segments will also (at least locally) benefit of the 25% tariffs and consequent declining volumes of Chinese finished product volumes exported to the US. On the contrary, the trade war and RCP ban will probably have a negative impact on the Chinese tissue industry, though not very significant. The reduced RCP import can be fairly easily replaced by other alternative fibre sources as RCP only represent a small fraction of the fiber consumed by the Chinese tissue industry. However, the fibre shortage caused by RCP ban has caused the domestic RCP prices skyrocketing which will increase tissue producers' production cost. Despite the tariff on US pulps, there is abundant non-US BSKP available in the international markets to meet Chinese tissue producers' demand. Therefore, the supply and price of BSKP in China is unlikely to change significantly.

> "Low RCP prices will benefit particularly the **AfH and private label** segments"

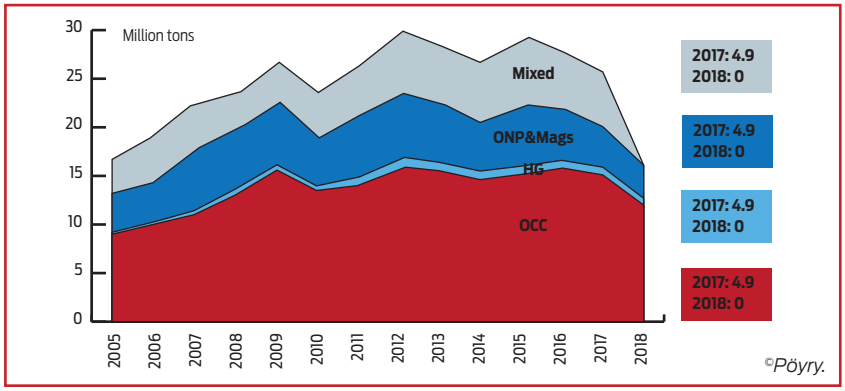
Even though tissue products are not traded as much as other P&B grades globally, the international trade (trade over any foreign border) of tissue products has increased steadily at 4-6% annually since 2000. In 2018, the global trade of parent rolls totaled roughly 3 million tons and of the finished products more than 5 million tons. The fact that tissue converting operations are often integrated with tissue manufacturing subsequently limits the net trade of jumbo reels more than that of finished goods. Main trade flows are between the US and Canada, within Southeast Asia and within EU countries. In 2018, the Chinese tissue capacity totaled 13 million ton/year, which is much higher than tissue demand in the country. The increasing pressure of oversupply in the domestic market pushes Chinese producers to explore overseas export possibilities. China has succeeded to export both jumbo reels and finished goods across continents even though the export value due to the obviously rather high transportation cost, is very low compared to the volume of the total tissue business in China. Currently the main trade partners for China are North America and Asia-Pacific. US has been a net importer of tissue, particularly finished products. China has been the single largest exporter of finished products to the US. Figure 2 presents the tissue trade between China and the US. The trade of tissue parent rolls between China and the US is marginal, but in 2018 China exported about 330,000 tons of finished products to the US (our number is somewhat higher than reported by CNHPIA due to differences in determining the article numbers included from the statistics). In July 2018, US hit China with 25% tariff on among many other products tissue



▲Fig. 1 - US-China trade war chronology.

▲Fig. 2 - Tissue trade between US and China in 2018. Source: Comtrade, finished goods include all traded tissue articles under HS 4818.

parent rolls and converted products. In retaliation, China also increased tariff from 5% (for MFNs) to 20% on the US tissue products effective in September 2018. An additional 5% will be imposed in December 2019. The imposed 25% tariff will remove the cost advantage from the Chinese exporters; as a result, in 2019 the tissue trade between the two countries is likely to decline. In fact, the 25% tariff has already driven down the export from China to the US. In the first half of 2019, from the same period in 2018, China's export of tissue paper to the US has reduced by 29.97% (CNHPIA). These volumes are replaced by imports from other Southeast Asian countries.



▲Fig. 3 - China RCP import by grade.

China solid waste ban

2018 has been an extraordinary year in many ways. Besides the escalating US-China trade war, the China solid waste ban has also caused turmoil to the global P&B industry. On 1 January 2018, China implemented the National Sword policy to restrict a variety of solid waste import including plastic, metal and recovered papers (RCP) to reduce pollution and prevent illegal waste smuggling. This is the strictest waste import regulation China has implemented so far and the government has shown great determination this time. The key restrictions against RCP can be summarized as following: unsorted/mixed RCP is banned for import to China; the allowed contamination level for imported RCP is reduced to 0.5% from 1.5%; import license is only granted for P&B mills with capacity > 50,000 t/a and it is not granted for traders or other middlemen. Moreover, on 16 June 2018 the Chinese government published a number of new instructions on pollution prevention and control, the significant drop in RCP imports could now even be followed by a total ban of imports by the end of 2020. Imported RCP is an important fibre source for Chinese P&B industry. Since 2009, the import level has been kept at a rather consistent level. In 2017, the total demand for RCP in China was 79 million tons, of which more than one third is satisfied by the imported RCP (25.7 million tons). In 2018, the imported RCP to China was around 17 million tons, reduced by 9 million tons comparing to 2017. The considerable reduction in RCP import has driven the prices of domestic RCP soaring. Consequently, the Chinese P&B producers, especially RCP based producers have been forced to take downtime whether due to RCP shortage or the outrageous RCP prices. However, the RCP ban had minimal impact on the tissue industry. RCP represents less than 7% of the fibre raw material used in the tissue industry in China. This is because by regulation RCP can only be used in toilet paper and hand towel production. In addition typically RCP is used in AfH sector which only accounts for about 12% of the total tissue market in China albeit growing fast. High grade (HG) is the most commonly used RCP grade in tissue. As presented in Figure 3, China

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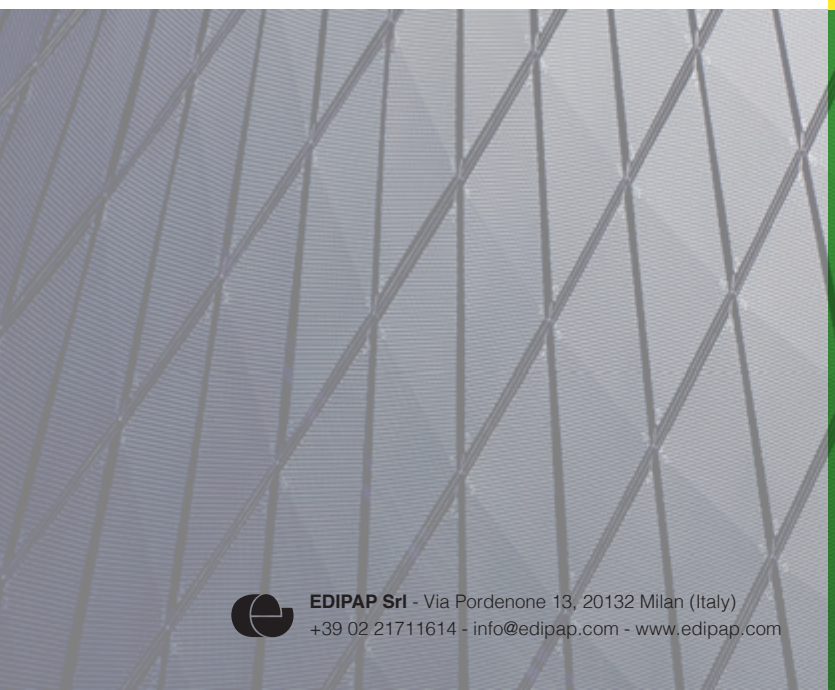

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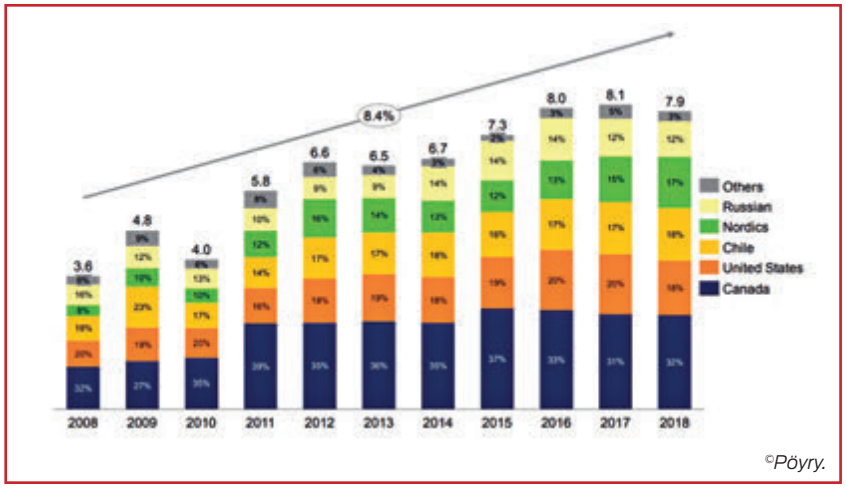

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▲Fig. 4 - BSKP export to China.

imported only 0.7 million tons of HG RCP in 2018. In conclusion, Chinese tissue industry should be able to find alternative fibre sources fairly easily if imported RCP is totally banned, be it domestically collected RCP, virgin wood pulps or often also non-wood pulps.

In the US, RCP has been widely used in the tissue industry, accounting for roughly 30% of the fibre raw material. Excessive supply and low RCP prices as a result of the China ban may cause changes in fibre furnishes in the tissue industry. US has been the largest RCP exporter to China, but the exporting volumes from US to China have reduced by almost 6 million tons in 2018 due to the ban. Part of the volumes found new destinations such as Southeast Asian countries and India. But even these countries are following China's step and restricting the import of RCP. Since the ban, RCP prices in the US especially unsorted RCP prices have plunged. Unsorted RCP prices dropped to negative because collectors have to pay for landfilling. The extraordinarily low RCP prices have attracted some of the tissue producers to use mixed RCP in their tissue production.

For example, Essity is upgrading its operation in South Glens Falls, NY to be able to use more residential curbside material to produce AfH towels. Using low priced mixed RCP can significantly reduce the cost structure of tissue producers; more tissue producers can be motivated to use mixed RCPs.

Market pulp

The trade war has not spared the market pulp either, China had imposed a 5% tariff on US imported pulps since September 2018 and will add an additional 5% tariff effective in December 2019. BSKP and fluff pulp have been the main pulp grades the US is exporting to China. In fact, the US has been the largest BSKP exporter in the world, accounting for about 25% of the global traded BSKP. Meanwhile, China is the largest BSKP importer globally, importing roughly 8 million tons of BSKP in 2018 which is correspondent to 35% of the total traded BSKP. Figure 4 presents the BSKP import development in China. In 2018, US exported about 1.5 million tons of BSKP to China, representing almost 20% of China's total BSKP import. The US has clearly been an important BSKP supplier for China, but when subjected to 10% tariff, US BSKP will lose its price competitiveness. The bad news is that there are plenty of alternative BSKP suppliers, e.g. from Canada, Nordics, Russia and Chile that Chinese companies can turn to. The implications to the US BSKP producers are that either they have to bear the tariff themselves in order to keep their price competitiveness, or they need to look for new markets. Southeast Asia could be one of the potential markets, but the potential is limited because nearly all the annual demand growth in market BSKP globally comes from China, while other Asian markets are rather stagnate. On the other hand, this is probably good news for the US tissue producers. The excessive pulp supply in the domestic market will likely to drive down the BSKP domestic prices. Southern US is the most significant fluff export region; US fluff producers are in a bit better situation as US exports such large volumes of fluff that replacements cannot be easily found in short term. There is an upside export potential for non-US fluff producers such as Stora Enso and CMPC. ●

> “The supply and price of **BSKP in China** is unlikely to change significantly”

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