

issue 44
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The magazine for the hygiene industry

**Digital Innovation,
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Transformational Change
in Pulp and Paper Industry**



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02 Around the world

24 In the spotlight

Digital innovation is shaping the future of manufacturing

- 26 Pulp, paper, and packaging in the next decade: Transformational change

35 Industry issues

Circularity in tissue business

44 Technical solutions

Fabio Perini, ecofriendly solutions consolidate its leadership in sustainability

- 46 Embracing sustainability thanks to GDM solutions
- 48 Boostek performance pack

Editorial Office **METissue**

P.O.Box: 45-134
Hazmieh – Lebanon
T 961 3 590 529
info@metissue.com
www.metissue.com

Editor-in-Chief

Carol Dib
carol.dib@metissue.com

Assistant Editor

Joy Jadam
joy.jadam@metissue.com

Contributing Editor

Dana El Sanioura

Advertisement Enquiries

Carine Villeneuve
carine.villeneuve@metissue.com

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UAE

Star Paper Mill enters tissue business

Star Paper Mill started up a new tissue paper machine in ICAD 2, Abu Dhabi. The 1st reel of tissue Jumbo reel was produced on 14th of July 2019.

The mill spreads over 27,000 sqm, in the Industrial City of Abu Dhabi (ICAD), UAE. The Recard-supplied DCT Crescent Former Tissue machine with the latest flexi-nip shoe press technology, will enable achieving higher bulk and softness. The machine deckle is 3.6 m having two rewinders with a capability of rewinding up to 4 ply. The annual production capacity would be about 40,000 tonnes of world class prime quality virgin tissue paper.

Solenis was selected as the specialty chemical partner for the entire project with a five-year contract. Solenis local team has a long history working with Star Paper management. Over time, they have built a strong relationship that

allowed Star Paper to trust the team to deliver a smooth startup on this project in a relatively short time, producing high-quality paper with a lower chemical cost package. Star Paper Mill is striving to follow the best environmental practices and to source the pulp from responsibly managed forests including FSC certified. SPM will produce a wide spectrum of hygienic tissue paper jumbo reels in various grades ranging from 12.5 gsm to 38 gsm towels viz. Facial, Toilet, Napkin, Kitchen Towel, Maxi, Centerfeed, Auto-cut, Industrial Rolls and Hand Towel. SPM specialisation will be in value added products such as low gsm facial tissue, ultra-soft and smooth tissue, lotionised tissue with a satin finish, bonded napkins, multicolor printable white napkin tissue and very high wet strength towels. The mill will also be producing pastel shades tissues.



Star Paper Mill started up a new Recard tissue paper machine on 14th of July 2019

Jordan

Fine Hygienic Holding partners with Engicon for a PWTP

In its bid to expand into the environmental solutions business, Engicon partnered with Fine Hygienic Holding (FHH) to design, finance, and build a process waste water treatment plant (PWTP) for its Arenbeh site in Amman. This 7-year project provides the factory with the ability to treat its waste water and reuse it for industrial purposes.

“It is exciting and gratifying for us to see this project achieving its desired results,” said Abdallah Khair, CEO of Engicon O&M, a subsidiary of Engicon. “This plant required a very particular design. It is relatively small, but it involves four different treatment technologies in order to reach the standards required by the client.”

The design capacity of the plant is 900,000 thousand litres per day. Almost 80% of the water coming to the PWTP is recycled back to the paper machines.

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EST12
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TSA
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DSS Module HSA
Heat Shrinkage Analyzer

Turkey

Lila Group becomes the first Company from Turkey to sign the 'CEO Pledge'

Lila Group, a corporate member of LEAD Network, undertakes to increase the number of female employees by 5% by the year 2023. Lila Group is the first Turkish signatory of the 'CEO Pledge' implemented by Lead Network.

"Various researches have been conducted up until today on the contributions of women to the economy and the challenges encountered by the female employees in the business life. Unfortunately, the outcomes of the researches are far from being promising and pleasant. We are the country ranked at the bottom of the list of female employment with 34% among the OECD countries. As a group, we always adopt an attitude in favor of gender equality, and we shall continue to do so for the future. In this regard, we are ready to do our best to enhance and improve the contribution of our women to our economy and business world. In this sense, CEO Pledge is a substantive opportunity for us. I am glad and honored to announce that we pledge to increase the number of our female employees by 5% until the year 2023." Alp Öğücü, CEO of Lila Group, commented.

LEAD Network, headquartered in Amsterdam, is the first and only non-profit association focused on senior women employees in the retail and consumer goods sector; It has over 4400 members from over 40 countries. Network Turkey; Avon, Barry Callebout, Bizim Toptan, Carrefoursa Chepe Turkey, Coca Cola Beverages, Colgate, Dr.Oetker, Haribo, Jacobs, Johnson & Johnson, Cotton, Lila Group, Metro, Migros, Nielsen, Procter & Gamble, PepsiCo, Pernod Richard, Tchibo Turkey, Unilever.

Algeria

Africaine Paper Mills starts tissue production

Algerian Africaine Paper Mills (APM) has successfully started up ANDRITZ PrimeLineCOMPACT tissue production line, including stock preparation. ANDRITZ has successfully started up the PrimeLineCOMPACT tissue production line, including stock preparation, delivered to Africaine Paper Mills (APM) in Algeria.

The ANDRITZ energy-efficient tissue machine has a design speed of 2,100 m/min, a production capacity of 100 MT/d, and a working width of 2.85 m and produces tissue for high-quality facial wipes as well as toilet and towel paper grades, from 100% virgin fibers. The machine is equipped with the latest ANDRITZ shoe press technology PrimePress XT Evo. With its energy-efficient design, improved dewatering, and reduced need for thermal drying, the shoe press minimizes energy consumption. Furthermore, the 16 ft. PrimeDry Steel Yankee enables a high drying capacity.

"Start-up of the mill was a great success, and the collaboration with ANDRITZ was very good. It is the first tissue machine for APM, and we are

proud to announce the first paper on reel. For us, good paper quality combined with energy-efficiency is of utmost importance. The combination of a steel Yankee and a shoe press enables efficient drying with substantial energy savings." Ziad Haffar, General Manager, Africaine Paper Mills (APM). APM chose Solenis to be its chemical partner supplying all specialty chemical applications, as part of a three-year contract. Within Solenis, Algeria is supported by the France & North Africa commercial team who worked closely with Solenis European application specialists and the Middle East team to support the successful start-up.

Africaine Paper Mills (APM) is an innovative paper manufacturing company founded by people with longtime and profound experience in the paper making industry. Its expansion plans include paper mills in several countries belonging to the MENA (Middle East & North Africa) region.



ANDRITZ PrimeLineCOMPACT startup at APM, Algeria

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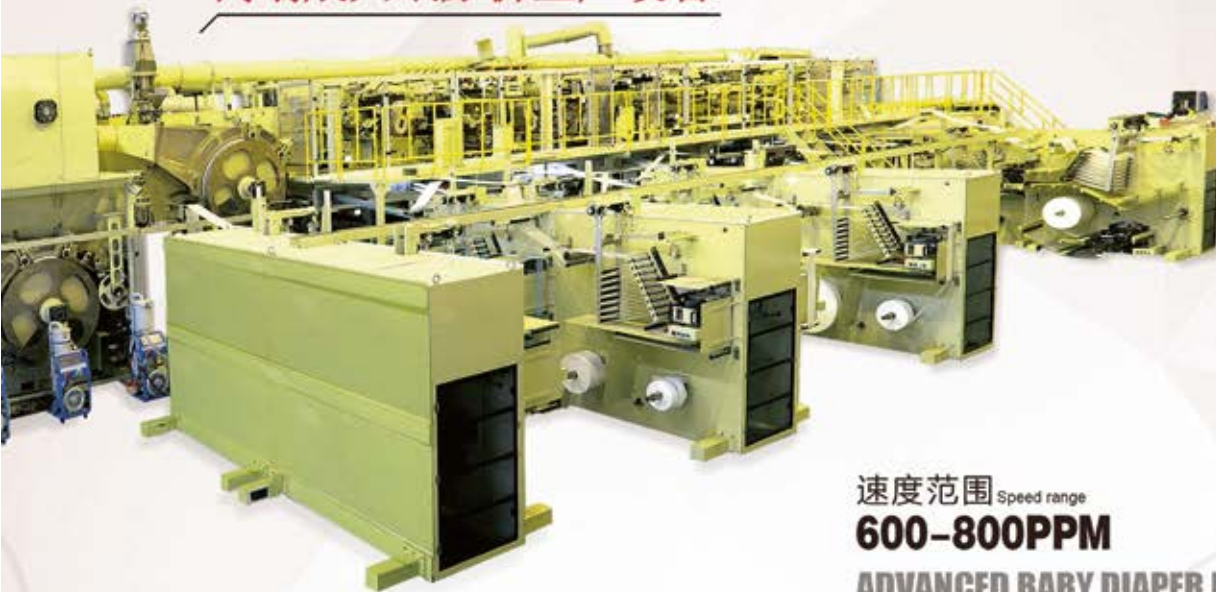


速度范围 Speed range

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地址: 福建省泉州市鲤城区常泰街道斗南街123号 邮编: 362000
电话: +86(0)595 22488988/389/588 传真: +86(0)595 22487588
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QUANZHOU HANWEI MACHINERY MANUFACTURING CO.,LTD.

NO. 123, Dounan street, Changtai avenue, Licheng district, Quanzhou, Fujian, China. 362000
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Portugal

EU Commission approves Portugal's investment aid to Navigator's tissue paper plant in Cacia

The European Commission has found Portugal's investment aid of €12 million to Navigator Tissue Cacia S.A. to be in line with EU State aid rules. The aid will support the Navigator Group's plans to invest about €114 million in the production of tissue paper in Cacia (Aveiro). The project is expected to create at least 133 direct jobs.

Cacia is located in the Centro region of Portugal, an area eligible for regional aid of the Treaty on the Functioning of the European Union). The Commission assessed the aid measure under the Guidelines on Regional State Aid for 2014-2020, which enable Member States to support economic development and employment in EU's less developed regions and to foster regional cohesion in the Single Market. The Commission found that without the public funding, the project would not have been carried out in Portugal or any other EU country, as it would not have been economically viable.

Furthermore, the aid is limited to the minimum necessary to render the project sufficiently profitable for the company to carry out the investment. Finally, the investment aid will contribute to job creation as well as to the economic development of the region. On this basis, the Commission concluded that the positive effects of the project on regional development outweigh any potential distortion of competition brought about by the State aid.

France

Global Hygiène signs the acceptance of A.Celli tissue machine

In August the Global Hygiène's technicians validated the Factory Acceptance Test, carried out at A.Celli Paper's facilities, for the tissue machine, the heart of the complete turnkey plant, entirely supplied by A.Celli Paper. The new iDEAL®1800S machine has a 2850 mm format and an operating speed of 1800 mpm. The turn-key project also includes an E-WIND® T100 rewinder and a R-WAY® roll-handling system

The Yankee supplied is the forged one of the latest A.Celli generation and has a diameter of 15'. The tests carried out fully satisfied the customer's expectations, authorizing the shipment of the machinery to its headquarters in Charavines, in south-eastern France.



A.Celli iDEAL®1800S machine

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Belgium

Sofina invests €150m in Drylock Technologies

Drylock, the family-owned hygiene manufacturer, announced the successful closing of the partnership it concluded with Sofina, allowing the investor to subscribe to approximately 25% of the shares.

The funds will be attributed to support the business plan of Drylock. Bart Van Malderen will remain the majority shareholder as well as chairman and CEO. “We were impressed by the speed and success of Drylock Technologies so far. The entrepreneurial spirit, the state-of-the-art production platform with a global presence, the portfolio of sustainable products, the healthy and promising customer mix, and our meetings with the Drylock team have all contributed to convince us of this investment’s merits. Drylock fits in our strategy of investing in growing businesses with a partner that also believes in the virtues of patience and entrepreneurship. We are looking forward to collaborate with Drylock’s management and to contribute to its success.” Stated Harold Boël, CEO of Sofina.

Bart Van Malderen, CEO Drylock Technologies, quoted: “In the past seven years we have been growing and building Drylock at an incredible fast pace. As such we have commissioned four plants from scratch, acquired five others in Russia, Italy, North America and Brazil, whilst leading product innovations with proprietary technology such as the fluffless and channel technology. Today we have a platform that allows us to continuously and rapidly further expand our business and I am pleased to welcome Sofina in supporting the further roll-out of our business plan.” Sofina (NAV of € 7Bn) is a family run and controlled investment company with equity holdings in Europe, the United States and Asia across many sectors with a particular focus on consumer goods, digital, education and healthcare.

Ontex launches its online diaper subscription offer

On August 21, 2019, Ontex announced the launching of Little Big Change in Benelux. Little Big Change is a diaper subscription service available exclusively online that will make the lives of modern parents a little bit easier. While providing up to 12 hours of protection, the diapers are free of perfume, lotions and chemicals. They are regularly tested for the presence of harmful substances and produced using 100% green electricity.

Following its successful launch in France in June 2018, the new Little Big Change diaper subscription service is now available in Belgium, the Netherlands and Luxembourg. The Benelux Little Big Change launch is supported by an online sales platform and significantly increases Ontex’ presence in Direct-To-Consumer e-commerce.

“The launch of Little Big Change in Benelux is an important step in the digital transformation of our company,” says Ontex CEO Charles Bouaziz. “It’s the first Ontex baby diaper available exclusively through an online subscription model, providing parents with a flexible and highly customizable purchasing and delivery service. Little Big Change is our response to changing consumer behaviors and needs. The subscription business model is an important pillar for the company’s future growth.”

The Little Big Change diapers are exceptionally certified: The top sheet has received the Dermatest 5-star seal; 100% of the fluff in the absorbent pad is bleached Totally Chlorine Free (TCF) and sustainably harvested in Forest Stewardship Council¹ (FSC) certified woods; The entire product is regularly tested for compliance with the German Oeko-tex² 100 certification standard.



¹ FSC: <https://www.little-big-change.com/certifications>

² Oeko-tex 100: <https://www.little-big-change.com/certifications>



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Further information, Please contact:

Contact person:	Zhang Jingwen	86-10-64778167	13521035679	QQ: 810158510
	Gong Ling	86-10-64778166	13520123792	QQ: 757159546
	Jin Heyi	86-10-64778168	13581723915	QQ: 1004915965
	Yi He	86-10-64778156	13511039543	QQ: 793914857

E-mail: zhilinzhan@sina.com, cpg@vip.163.com



UK

Northwood expands tissue operations through two acquisitions

Northwood has acquired the trade and assets of the whole Sidcot Group, comprising of the recycled tissue mill at Chesterfield and the converting operations of Matryx, Techcel and Negociar.

It has also acquired the trade and assets of Dicepa Papelera in Enate, Spain, as well as the trade and assets of the converting plant of Manipa in Madrid, this move will give the wider Northwood Group fresh access to the markets in Spain and mainland Europe. The two acquisitions will bring additional valued recycled tissue production and further increase the security supply for the converting papers needed by the Northwood companies.

Germany

SMS digital and Voith cooperate to push IIoT platform development

Voith and SMS digital, the digital subsidiary of SMS group, announced plans to bundle competencies in platform development. The aim of the cooperation is to offer platform services for their industrial Internet of Things (IIoT) solutions. The two companies are joining forces to digitalize business with smart applications and efficiently share development resources and competencies.

The joint platform provides both companies the opportunity to use new applications across different industries in the other's worldwide core markets and speed up the development process of customer-relevant applications. For example, SMS digital can introduce its Smart Alarm more efficiently in Voith's core markets and the process industries. Meanwhile, SMS benefits from Voith's OnCumulus apps designed for production efficiency enhancement and asset management. While most of the platform services are industry-independent and can be jointly used by both companies, some that are app- or industry-specific will be reserved for the respective company. The customer gateways MyVoith and mySMS still remain the central and cross-sector contact points for customers, partners and suppliers of each company. Additionally, these gateways serve as company-specific access points to the respective IIoT applications. The platforms and applications are accessible via all common mobile devices. "Together, we provide platform solutions and technologies for the digital age that offer real added value to our customers," states Dr. Benedikt Hofmann, CTO, Voith Digital Ventures. "SMS digital identifies and develops innovative products for the metals industry, and we are very pleased to have the opportunity to take a further step in the digital transformation of key global industries together with Voith," says Prof. Dr.-Ing. Katja Windt, Member of the Board of Management, SMS group GmbH.

Switzerland

Voith Group to acquire BTG for €319 million

Voith has signed an agreement with Spectris plc to acquire BTG for a total gross cash consideration of €319 million. With BTG, a multinational provider of integrated, highly specialized process solutions for the global pulp and paper industry, Voith strengthens its position as full-line supplier. The transaction is expected to close late in the fourth quarter of 2019. The closing is subject to the company obtaining all regulatory approvals as well as other customary closing conditions.

"BTG and Voith together have 250 years of technological experience in the global paper industry. This strategic step will bring many advantages for the entire industry. With BTG, we found an ideal match to complement our portfolio and get the chance to add a high-performing company with widely recognized expertise in the pulp and paper market. This helps us to expand our competitive position as a full-line supplier for the paper industry in the areas of consumables, instruments, services and software," states Toralf Haag, President & CEO of the Voith Group. BTG offers a high-value portfolio of optimized and customized solutions for a range of applications, mainly in the areas of packaging, graphic papers and tissue. Furthermore, BTG is a decisive partner in the digital transformation of the pulp and paper industry with its offerings in the areas of data analytics, automation and software. It will therefore add value to Voith's Papermaking 4.0 portfolio. BTG, founded in 1921 in Sweden, is today headquartered in Éclépens, Switzerland, and employs around 600 professionals across the world. It operates four manufacturing sites, three research centers and several regional application centers.

Romania

MG TEC Group orders two rewinders from A.Celli

A.Celli Paper has signed a sales contract with MG TEC Group for the supply of two latest-generation E-WIND® T100 rewinders, which are destined to the Dej plant in Romania. With a width of 2850 mm, they will use high quality tissue paper, with basis weight range from 14 up to 21 gsm; they are equipped with four unwinders each and reach an operating speed of 1600 mpm, producing finished rolls with a maximum diameter of 2500 mm. The advanced software, present on the two machines, manages in an extremely intelligent way the control of the web tension, preventing or minimizing the loss of bulk during the winding phases, thus maintaining the high quality of the product throughout the process.

Slovenia

Slovak Hygienic Paper Group to boost yearly production capacity with 79,000 tons

The Slovak Hygienic Paper Group appointed Toscotec as turnkey supplier of a new tissue line at Paloma mill in Sladki Vrh, Slovenia. The delivery is scheduled for March 2020 and the start-up for June 2020. The turnkey supply includes one AHEAD-2.0L tissue machine, equipped with a second generation Steel Yankee Dryer TT SYD, Toscotec's shoe press technology TT NextPress and gas-fired hoods TT Hood-Duo. The net sheet width is 5,500 mm, the maximum operating speed is 2,000 m/min and the production capacity is 220 tpd. The AHEAD-2.0L machine will replace the mill's existing PM6 and will manufacture high quality toilet tissue, kitchen towel and napkins for household and professional use in the AfH segment. The AHEAD-2.0L machine will replace the mill's existing PM6 and will manufacture high quality toilet tissue, kitchen towel and napkins for household and professional use in the AfH segment. Following a capital increase by the private-owned investment fund Eco Investment in 2016, and the integration into the Slovak Hygienic Paper Group (SHP) group, the Slovenian tissue supplier Paloma aims to become the leading manufacturer of hygienic paper products in the Adriatic region and beyond. Founded in 1873, Paloma is a public limited company with a long-lasting tradition in the manufacture and marketing of hygienic paper products in Europe. The company's annual production capacity is 72,000 tonnes of tissue and it currently employs 675 people. Paloma is predominantly export-oriented and it currently holds the position of market leader in South-East Europe.

Italy

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 machine installations in the last five years. Since 2015, Toscotec has received five orders from Italian tissue producers for their paper mills located in Italy. These include two complete tissue lines for Eurovast's Cartiera della Basilica. One line replaced an older machine and has been in operations since 2015 at its Bagni di Lucca mill. The other line is 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 Cartiera Confalone S.p.A., who is scheduled to start up a new AHEAD 2.2 tissue line in 2020. 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. 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 erection. In 2017, Toscotec rebuilt on a turnkey basis PM10 of Lucart Laval sur Vologne mill in France. 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.

Cartiera Confalone invests in a new energy-efficient tissue line

Cartiera Confalone is the protagonist of an important investment that will see the construction of a new advanced production base in Montoro, Avellino, with leading-edge tissue technology. The plant includes an automated warehouse and one AHEAD 2.2 tissue line supplied by Toscotec on a turnkey basis. Cartiera Confalone's Montoro mill represents the biggest tissue investment in the south of Italy in the last twenty years and it will give new impetus to the local job market. The new tissue line consists of one AHEAD 2.2 tissue machine, equipped with TT NextPress, a second generation TT SYD and gas-fired hoods designed with numerous stages of energy recovery. The sheet trim is 2,850 mm, the design speed is 2,200 m/min and the production capacity is over 35,000 tpy. The tissue line is dedicated to the production of toilet

tissue, napkins and towels and it will process 100% pre-dried virgin pulp and converting broke.

The start-up is scheduled for the fourth quarter of 2020.

The turnkey scope includes two newly designed OPTIMA 2200 slitter rewinders.

Cartiera Confalone already has a Toscotec MODULO-PLUS tissue machine, installed since 1999 at its mill in Maiori in the province of Salerno, in 2013 the tissue machine's cast-iron Yankee was replaced with a TT SYD in 2013.

Cartiera Confalone is a family-run business focusing on the production of toilet paper, kitchen roll, napkins and jumbo rolls of various width. Cartiera Confalone's products are distributed throughout Italy, in particular in the centre and in the south of Italy, with a turnover that in recent years has seen a significant increase both in Northern Italy, in the U.E. and extra U.E.

Sofidel bids farewell to disposable plastics in its workplaces

Sofidel has decided to abandon use of disposable plastic items in its workplaces.

In Italian offices and production sites, all disposable plastic bottles, glasses, plates and cutlery have been eliminated, replaced with more sustainable materials or ones with a more consolidated recycling system such as, for example, returnable glass bottles, aluminium cans, wood pulp plates and glasses, and wooden cutlery. This protocol will be extended over the coming months to all Group companies in the 13 countries across which Sofidel operates in Europe and the US.

The decision to eliminate disposable plastic in the work environments comes just a few weeks after the company announced that it will halve use of conventional plastic in its production by 2030. This will be achieved with the introduction of new paper packaging, already present or due to arrive on European distribution shelves, the progressive use, on some markets, of recycled plastics or bioplastics, and a general reduction in the thickness of the plastic film used in the production process (launched some years ago). The commitment begins with the Sofidel brands (including Regina, Cosynel, Nalys, Le Trèfle, Sopalín and Kitten-Soft), many of which are leaders on their reference markets.

The Sofidel Group is one of the world's leading manufacturers of tissue paper for hygienic and domestic use and has its headquarters in Porcari, Italy. Founded in 1966, the Group is present in 13 countries and currently counts more than 6,000 employees. With an annual production capacity of 1,308,000 tonnes, the Group is second in Europe and sixth in the world in its sector.



Cartiera Confalone, Montoro, Avellino, Italy

Sweden

Klippans Bruk starts up new tissue machine

Klippans Bruk's 1st reel was produced on August 19. The Recard-supplied Crescent Former (PM11) has an operating speed of 1,700 m/min, a width of 3200 mm and produces 30,000 tonnes/yr of white and colored high-quality tissue. The turnkey supply includes a stock preparation system, broke line, approach flow system, fiber recovery system and water distribution. The supply for Klippan Mill comprises also a high performing slitting rewind-er with 3 unwind stands. Operating since more than 50 years, Klippans Bruk AB is today one of the world's leading producers of deep-coloured tissue.

ANDRITZ acquires KEMPULP

ANDRITZ has acquired the Swedish company KEMPULP, a specialist provider of process technologies for the chemical pulping industry. The company designs and markets technologies used in chemical pulping, including pulp washing, oxygen delignification and bleaching technologies.

The acquisition includes all of KEMPULP's intellectual property rights, technical expertise, tools, systems and inventory. The company supplies process solutions, equipment, upgrades, parts and services that complement ANDRITZ's existing offering for pulp producers.

Joachim Schönbeck, Executive Board member of ANDRITZ AG and responsible for Pulp & Paper Capital Systems says: "KEMPULP's products and process technologies will continue to be a strong player on the market, providing solutions that complement the ANDRITZ technologies and equipment for specific chemical pulping processes – both for new plants and upgrades to existing installations. As a result, KEMPULP's process technologies and products will enable ANDRITZ to offer optimized solutions to the benefit of its customers."

The KEMPULP organization will be fully integrated into the ANDRITZ Pulp & Paper organization. KEMPULP is located in Karlstad, Sweden and has approximately 30 employees.

Metsä Tissue invests EUR 230 million to increase fresh fibre-based tissue production

In April 2019, Metsä Tissue published its new strategy, which includes the Future Mill programme. The programme aims to increase the long-term industrial efficiency and environmental performance of the tissue paper business. In line with its parent company's goals, Metsä Tissue is also aiming for totally fossil-free mills by 2030. "Metsä Tissue is the only tissue paper producer on the market with strong roots in sustainably managed northern forests. Premium tissue papers made from pure fresh fibre, grown close to our customers and consumers and the leading tissue paper brands in the Scandinavia, Katrin, Lambi and Serla, have always played an important role in our company. Now we're planning to continue to increase premium tissue paper production by investing, in the first phase, approximately EUR 230 million at the Mariestad mill. Our increasingly strong focus on fresh fibre in the future is also a result of the continuous decline of the availability and quality of recycled fibre.

An investment in the production of premium fresh fibre tissue paper products with modern technology is the most sustainable solution for the future," says Esa Kaikkonen, CEO of Metsä Tissue.

Metsä Tissue has initiated an environmental permit process and a pre-feasibility study to create preconditions to double the company's tissue paper production in two phases and to construct an automated warehouse and an office building in the Mariestad mill site. The study is expected to be completed in the first half of 2021, in which case the final investment decision concerning the first phase could be made during the second half of 2021, after the environmental permit has been granted.

In the first phase, the planned investments would increase Mariestad's annual tissue paper production capacity by 50,000 tonnes fully as of 2024.



Klippans Bruk's 1st reel was produced on August 19th, 2019

China

Get A First Look at the Hot Topics for the 6th Fastmarkets RISI Asia Pacific Hygiene Products Symposium

In the past year, despite rising raw materials cost, the disposable hygiene products market competition remained fierce due to sufficient production capacity. With stricter environmental protection policies, changes in consumption patterns, as well as the serious homogeneity of products and inadequate R&D and innovation problems faced by the industry, the industry reshuffle and enterprise transformation and upgrading have been forced. In this context, Fastmarkets RISI will hold the 6th Fastmarkets RISI Asia Pacific Hygiene Products Symposium in Shanghai, China from December 8th to 10th, 2019. Discussions will take place surrounding supply and demand, as well as the opportunities and challenges of the hygiene products industry. Other hot topics will include strategic drivers for the hygiene market, changing demands of the consumer, innovations in nonwovens, feminine and adult incontinence products, wipes market, etc. Meanwhile, top industry players will be invited to deliver in-depth and state-of-the-art lectures, as well as provide a better communication and idea exchanging platform.

Main topics of 2019 conference include:

- The General Situation and Development Trend of China Hygiene Products Industry
- Consumption Trend of Hygiene Products Industry
- Giving Chinese Consumers What They Want: A Producer's Perspective
- Constant Innovation to Meet Changing Customer Needs: A View from a Nonwovens Producer
- Developing Trends of New Composite Nonwovens
- Demand and Development of China Disposable Hygiene Products Fabrics
- Innovative Application of Nonwovens in Hygiene Products
- Developing Trends of Dry Cotton Wipe Market in China
- The Future Development Trend of

Diaper Core Technology

- Application and Developing Trends of tampons in China
- Development Analysis of Adult Incontinence Products in China
- Market Trends Analysis of Light Incontinence Products in Japan
- Panel Discussion: Innovations in Nonwovens
- Panel Discussion: Outlook of Adult Incontinence Products Market

Why attend?

- A chance to listen to industry experts and association leaders interpret hot topics such as government policy direction, supply and demand status in China, market outlook and technology innovations.
- Develop business contacts and generate business opportunities and partners. RISI hygiene products symposium serves as a communication platform for upstream and downstream enterprises in the industrial chain
- One of the biggest and most complete conferences on disposable hygiene products. Participants will gain insight into the changing global market, including China and Southeast Asia for business and procurement strategy optimization.

Who will attend?

- Nonwoven producers
- Chemical and machinery suppliers
- Import traders
- Brand-owners
- Financial or consulting company

Successful Conclusion of the 26th China International Disposable Paper Expo

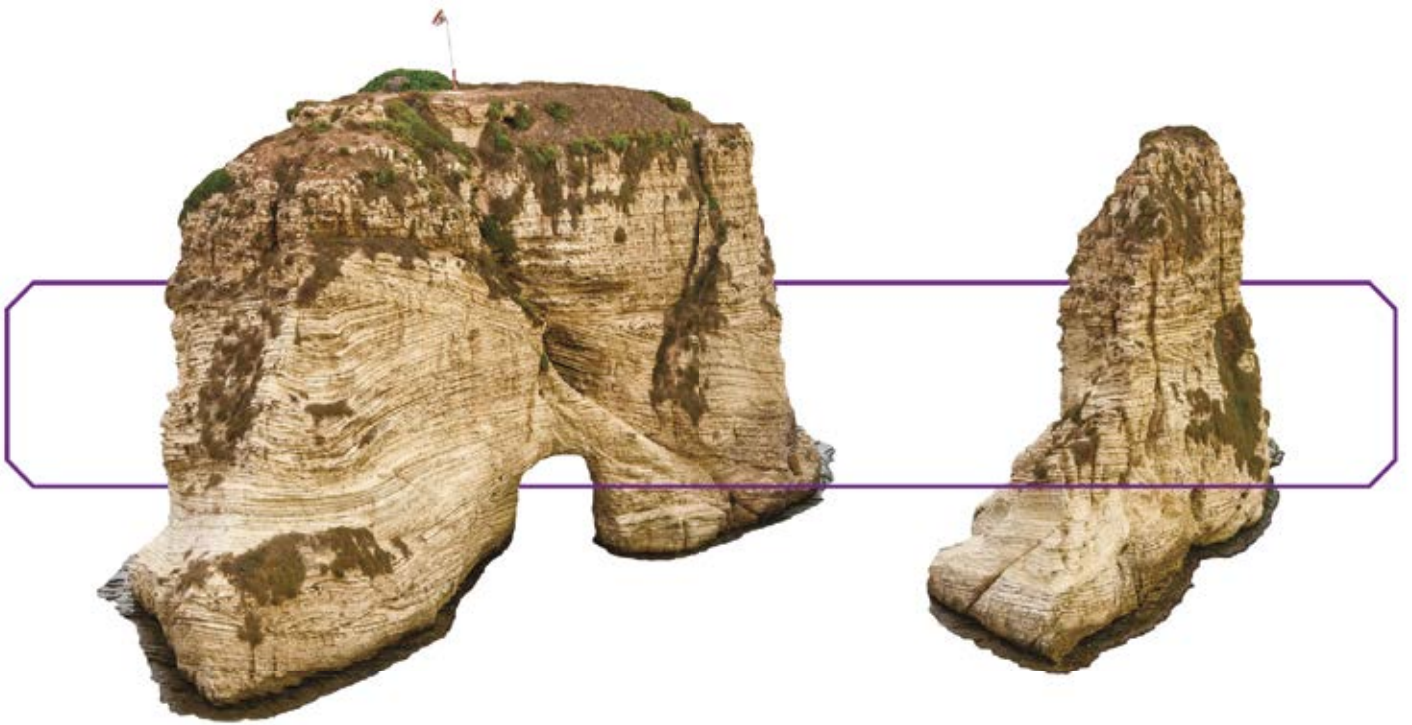
The 26th China International Disposable Paper Expo (CIDPEX2019) was successfully held in Wuhan International Convention Center (Wuhan, Hubei Province, China) from April 17 to 19, 2019. The Expo, with an exhibition area of 80,000 m², attracted 876 enterprises from more than 50 countries, and 35,000. This annual industry event has become an important bridge for understanding the Chinese market, exchanging the latest market trends and negotiating about domestic and foreign trade.

As a recognition of industry pioneers

and industry leaders who contributed to the development of the industry, CIDPEX2019 presented the "Industry Pioneer" and "Industry 2018 Top 10 Enterprises" awards at the CIDPEX2019 welcome dinner and OK guest appreciation dinner held on April 16. CIDPEX2019 included four pavilions: tissue paper pavilion, disposable hygiene products pavilion, raw materials pavilion and machinery pavilion, which are subdivided into 11 areas covering the whole industry chain involving the upstream and downstream industries of tissue paper and disposable hygiene products industry. The three-day Expo attracted more than 1,000 brands of products on display, and hundreds of equipment for start-up demonstration on site. During CIDPEX2019 numerous refreshing products and equipment were showcased and injected new vitality into the industry, including the cream paper, disinfection tissue, easy-to-break-up toilet tissue, soft cotton tissue, etc. in the tissue paper pavilion, sanitary napkins with surface based on cotton, bamboo, corn and other natural fibers, more breathable sanitary napkins, menstrual hygiene pants, anti-back leakage adult diapers, mini wet tissue and other star products with different characteristics in the disposable hygiene products pavilion, as well as new products, new equipment and new technologies with upgraded performance in the raw materials and machinery pavilions. FOCUS Tissue & Hygiene Conference, was held from April 15 to 16, attracting 800 delegates. This conference had three major thematic conference halls: tissue paper, disposable hygiene products and marketing, with a total of 30 keynote speeches and 4 interactive forums. Authoritative industry associations, well-known global brand enterprises, consulting institutions and senior experts from the industry were invited as hosts and guest speakers, to present new trends and technologies in the industry, plus, discuss the major difficulties encountered in actual operation and production process. CIDPEX 27th edition will be held in Nanjing International Expo Center (Nanjing City, Jiangsu Province, China) on April 22-24, 2020

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INDEVCO

APP will strengthen their fleet with 18 PMP machines

PMP (Paper Machinery Producer) is supporting the dynamic development of one of the biggest pulp and paper companies in the world for almost 20 years. On 24 of May 2019, APP has decided to award PMP with another project. This time scope of supply covers (18) eighteen complete Tissue Machines to APP's new mill in Rudong Jiangsu, China. APP has chosen Intelli-Tissue® EcoEc 1600 Premium. It is a perfect match for APP, thanks to premium tissue quality provided from the 1st day, very low media consumption, high capacity of the machine and high efficiency (over 95%). Furthermore, the project has a high return on investment what sealed the agreement between both companies. All eighteen (18) Tissue Machines will be designed and manufactured with the same concept to produce tissue from 11,5 up to 22,0 gsm at the reel. Machines are designed for a maximum speed of 1600 m/min. Intelli-Tissue® EcoEc 1600 platform is a perfect balance between achieved capacity and optimum energy savings. New machines will strengthen APP position on Chinese tissue market adding capacity of premium products with low green footprint thanks to ultra-low media consumption provided by PMP's Intelli-Tissue® EcoEc line.

A.Celli meets customers demand by opening new company branch in Foshan

It has been almost 20 years since A.Celli envisioned future success of its company in Asia, by observing the growing demand for paper and nonwovens machinery, opening its first branch office and, later, the operative A.Celli Shanghai Machinery Company in Shanghai, China. In Spring 2019, in order to be even more competitive and to give its Asian customers the utmost attention and the best services they deserve, A.Celli opened an additional facility in the south of China. This new reality is A.Celli Foshan Technology Co. Ltd., located in Foshan, in the province of Guangdong. The new company branch team consists of highly specialized managers and technicians, particularly focused on the market in south China, ready to offer the

best of A.Celli technology, guaranteeing services, such as commercial assistance, post-sales service, additional technical support and much more to the continuously growing clientele.

Hebei Huabang to install two new tissue machines

Hebei Huabang and Baosuo Enterprise signed a contract for two BaoTuo Crescent Former Tissue Machine. Both machines have a designed speed of 1,300 m/min and a trim width width of 3.55 m. Each machine has a production capacity of 70t/d when producing basis weight of 15 g/m². Startups are expected in the second half of 2020. Huabang currently has two BaoTuo tissue machines, with an annual output of 30,000 tons was completed in 2016.

Two new Crescent Former machines for Luoyang Jieda Paper

Luoyang Jieda Paper has signed a contract with Baosuo Enterprise for the supply of two BaoTuo Crescent Former tissue machines. The contract includes the general contracting project from the sizing flow system to the reeling completion. Each machine, has a design speed of 1,300 m/min and a width of 2,850 mm. When producing facial tissue with a basis weight of 15 g/m² and a crepe ratio of 30%, the output of a single tissue machine will exceed 50 t/d. The project is scheduled to be delivered in the Spring Festival 2020.

Baoding Ruifeng Paper increases yearly tissue capacity to 58,000 tons

Baoding Ruifeng Paper and Baosuo Enterprise officially signed a contract for two new 16,000 tonne/yr BaoTuo Crescent Former tissue machines. The design speed of each machine is 1,300 m/min, and the trim width is 2,850 mm. The tissue machines will start production in the first half and the second half of 2020 respectively. Baoding Ruifeng Paper currently operates two tissue machines from Baosuo Enterprise with a total capacity of around 42,000 tonnes/yr.

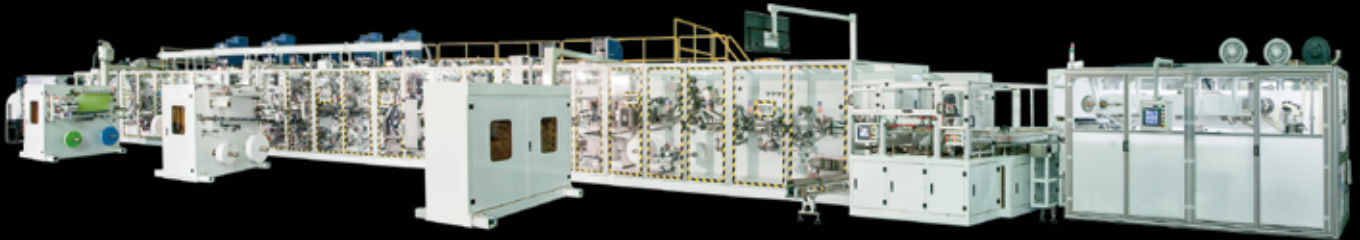
Aowei Paper and Baosuo Enterprise Group signed a general contracting project

Aowei Paper and Baosuo Enterprise Group signed a general contracting project for an annual output of 50,000 tons of household paper. The contract includes Baotuo tissue machine and Baosuo converting equipment. The project is scheduled to be officially put into operation in the first half of 2020.

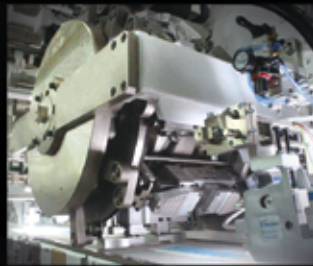
Aowei Paper is located in Sanjiang Town, Xinhui District, Jiangmen City, Guangdong Province. It is a Sino-foreign joint venture that integrates R&D, design, production and sales of professional household paper. Following the startup the company plans to target the Pacific Coast region market including China, Japan, Australia and Southeast Asian countries.

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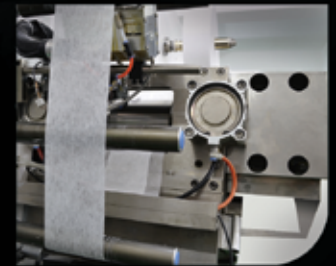
Core turning unit in
Panty diaper



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unit in T shape
diaper

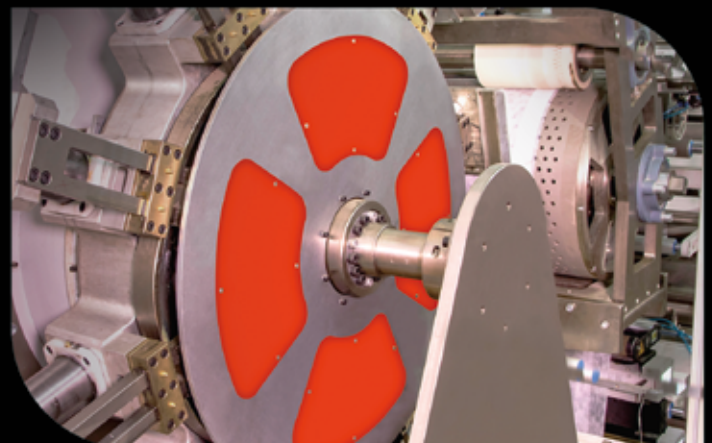


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MALAYSIA

Vinda Group builds regional headquarters in Malaysia

Vinda Group Southeast Asia (Vinda SEA), a unit of Hong Kong-listed Vinda International Holdings Ltd, officially launched the construction of its regional headquarters with a groundbreaking ceremony. Located on a 27-acre site filled with greenery, the state-of-the-art regional headquarters will comprise a double-storey manufacturing plant with raw material warehouse, a finished goods warehouse, the Vinda Innovation Centre and a six-storey administration block to be implemented in phases, in line with Vinda's five-year plan. The investment of more than half a billion ringgit over the next five years in multiple projects to set up the Vinda regional hub represents Vinda's commitment to Malaysia and to the state of Selangor.

Vinda SEA President Su Ting Nee said at the ceremony that the regional headquarters will not only centralise expertise and high-value activities in Malaysia, but also make the group globally competitive through the use of the latest technologies and processes with automation used where possible. Vinda SEA also anticipates that these changes will increase capacity by more than 20 percent when the facilities are fully in operation. Examples of the automation that are planned include automated storage and retrieval system, automatic raw material supply to production lines, pre-selection of finished goods to be loaded and a fully automated first-in first-out system. The automation and integration will also help to reduce the carbon footprint, which is in keeping with the company's sustainability policy.

The regional hub will develop, manufacture, and/or market four different product categories, namely, baby care, incontinence care, feminine care, and tissue products. Drypers, TENA, and Libresse are currently the market leaders, while Vinda Deluxe is seeing strong growth momentum in the markets since the 2017 launch. This facility will serve mainly the Southeast Asian market, and support sales to more than 25 countries, with Malaysia being the strongest market. In line with Vinda's five-year plan, the first phase is expected to be completed in 2021, when the warehouse will also be operational. The second phase is expected to be completed by 2023, with manufacturing facilities and the Innovation Centre to be in operation by then.

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KADANT

JAPAN

Marutomi Group starts up new tissue machine

The Marutomi Group started up a MODULO-PLUS ES tissue machine supplied by Toscotec at its Marutomi Paper's mill in Fuji city, Shizuoka, Japan. This is the first of two tissue lines ordered by the Japanese producer. The second line is scheduled for start-up in 2020 at Ono Paper's mill.

The MODULO-PLUS ES machine features a sheet width of 2,850 mm, an operating speed of 1,500 m/min and produces over 22,000 tpy of high-quality tissue. It is equipped with TT NextPress, a second generation TT SYD, TT Hood-Duo steam-heated hoods and Toscotec's proprietary Distributed Control System TT DCS, which was developed especially for this project on a Mitsubishi platform, in cooperation with the Japanese Corporation.

Mr. Shinichi Kato, Vice President of Marutomi Engineering Co., Ltd., says,

"Toscotec met our targets in terms of project management, delivery and execution. Toscotec, with the collaboration of Kobayashi Engineering Works, supported us 100%, making adjustments and proactively helping the progress of the project. Both commissioning and start-up went very well. We are happy with the paper quality we are getting right after start-up and our team is already working with Toscotec to fine-tune all the key parameters. We expect great results on the energy efficiency of this production line".

Founded in 1955, Marutomi Paper is one of the main tissue producers in Japan. The Marutomi Group today mainly specializes in toilet tissue from 100% recycled fiber, with an annual production output of 150,000 tons, of which 95% of toilet tissue and 5% of kitchen towel, and an estimated market share of 15%.

Paper Converting Machine Company acquires RDP Marathon and IPT Digital

Paper Converting Machine Company (PCMC), part of the Barry-Wehmiller Converting Solutions Platform, is joining with RDP Marathon Inc. and IPT Digital, and expanding its offerings for customers to include digital printing technology.

RDP Marathon has delivered engineered machine solutions for a variety of printing and packaging markets for 30 years. Through a partnership with IPT Digital, RDP Marathon also provides systems that convert existing presses into high-speed digital printing platforms, broadening its capabilities and reach across multiple packaging markets. Adding this innovative technology to PCMC's portfolio of solutions not only will accelerate the company's growth in its current markets, but also support its expansion into new markets, particularly the folded carton business.

"We're eager to have RDP Marathon and IPT Digital join the PCMC family," said Stan Blakney, PCMC President. "As we look to augment our print business, their expertise will enable us to quickly break into new markets and diversify our product portfolio. Digital printing continues to experience substantial growth, and we're excited to enter into that market through this acquisition."

Barry-Wehmiller Chairman and CEO Bob Chapman added: "We are thrilled to partner with RDP Marathon and IPT Digital, as this investment highlights our commitment to advancing the technology and service we can provide for current and future customers, while cultivating our unique culture of care and collaboration."



Marutomi Paper's mill started up Toscotec MODULO-PLUS ES tissue machine

MEXICO

Blue Tissue starts up A.Celli tissue machine

On July 7th the A.Celli iDEAL® Master Tissue Machine was successfully started-up, beginning production for the Mexican customer Blue Tissue Sapi de C.V.

This is a single machine (2700 mm pope reel width) for the production of tissue rolls with a diameter of 2500 mm, working at 2000 mpm speed, ensuring a production of 110 t/d.

An advanced version of DCS has been installed, with a very brand new graphic interface.

The tissue machine is also equipped with the latest generation of steel A.Celli iDEAL® forged YD.

The new turnkey plant, which includes the two-ply slit A.Celli E-Wind® T100 rewinder, in addition to the tissue machine, integrates the existing Customer's converting line. The A.Celli iDEAL® was installed in the Apizaco plant, in the Mexican state of Tlaxcala, with a great teamwork between the technicians of A. Celli Group and the customer's staff. Apizaco, which means "place of thin water" in the native language náhuatl, therefore "place with a little river", is located at an altitude of 2,424 m and in a strategic position between the capital, Mexico City, and the port of Veracruz, on the east coast.



Blue Tissue started up A.Celli iDEAL® Master Tissue Machine on July 7th, 2019

COSTA RICA

Kimberly-Clark Invests \$42 Million in Costa Rica

Kimberly-Clark will invest \$42 million in its production and supply center in Coris, as well as in its Global Shared Services Center in Costa Rica. The announcement was made today during a visit of the President of Costa Rica, Carlos Alvarado, to the company's plant in Coris, Cartago.

With the new investment, the company will buy high-tech equipment to manufacture more baby, kids and feminine care products, as well as expand the production plant and the Global Shared Services Center, promoting more employment in the country.

"This is a day to celebrate in Kimberly-Clark, our country, and the communities that have become our home for so long," said Gonzalo Uribe, Kimberly-Clark's Vice President of Northern Latin America.

"This investment demonstrates the great history that we have in Costa Rica and our compromise to make our business grow even more in here. We are proud to supply essential products for Latin America and be a company where people can develop their careers," he added.

The investment is part of Kimberly-Clark's plan to increase its production capacity for domestic con-

sumption and exports. The company supplies Costa Rica with a daily production of more than 3 million diapers and 2,5 million sanitary napkins. It also produces 5 million products daily to supply Central America, Panama, the Caribbean and the United States (Puerto Rico).

The Head of State's visit to the Kimberly-Clark plant in Coris was an opportunity to highlight the company's growth potential in Costa Rica. "Having Costa Rica as an investment center in Latin America is key for the country's development and is reflected in more opportunities for our citizens. We are pleased to know that our strengths as Costa Ricans have opened the door to new jobs that improve the life quality of more families," said President Carlos Alvarado. Jorge Sequeira Picado, Managing Director at CINDE, declared: "in 2014, Kimberly-Clark invested US \$31 million and today, it reaffirms its commitment to Costa Rica by giving us the positive news of an additional US \$42 million investment. Additionally, the company will increase its employment footprint in the services center. This announcement confirms, once again, the strong roots that multinational companies develop in the country, which translates into more and better jobs for Costa Ricans." For 22 years, Kimberly-Clark has grown its business in Costa Rica, contributing to the communities where it operates. In 2018, it invested more than \$5,2 million to open a 5,100 square meters warehouse of raw material in Cartago. It also maintains a strong commitment to sustainability. Recycling programs, such as "AmbientaDos", has collected more than 21,000 metric tons of post-consumer waste enter landfills.



April 22-24, 2020

Nanjing, China

The 27th China International Disposable Paper Expo



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CIDPEX2020

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BRAZIL

Körber Group expands business area tissue with Brazilian embossing roll specialist Roll-Tec

The international technology group Körber acquires Roll-Tec Cilindro Ltda. based in São Paulo, Brazil. Roll-Tec develops, produces and sells engraving cylinders for embossing machines for tissue paper and other tissue products. The acquisition was completed effective July 31, 2019.

The aim of the acquisition is the further international expansion of the Körber Group's Business Area Tissue. The Business Area offers complete solutions for converting and packaging machines for toilet paper, folded tissue and paper towels.

Roll-Tec is the Latin American technology leader in the embossing sector and develops engraving cylinders and produces and sells embossing rolls for tissue production. At the same time, the company's about 60 experts support customers in the development of new embossing patterns, including the manufacture of the corresponding rollers up to the delivery of the engraving cylinders. Within the Körber Business Area Tissue, Roll-Tec will work closely with Engraving Solutions in Italy and Fabio Perini's Joinville site in Brazil.

With this acquisition, Körber is expanding its product range for its Latin American customers.

"We are very pleased to further strengthen our position in the Latin American Tissue market together with Roll-Tec and to drive forward our entry into the North American market," says Dineo Silverio, President of Fabio Perini Brazil. "Thanks to the addition of Roll-Tec to our technology portfolio, we can offer our customers additional, differentiated products and solutions".

"The combination of 50 years market experience of Roll-Tec and Fabio Perini will drive both companies to consolidate and expand their leader-

ship in the Americas," adds Oswaldo Cruz Junior, CEO of Körber's Business Area Tissue.

"Körber is the ideal strategic partner for us," explains Jose Antonio Logiodice, Managing Director of Roll-Tec. "Our combination with Körber's Business Area Tissue creates added value for our customers. The acquisition also opens up new and long-term market prospects for us".

CMPC acquires Sepac for \$330M

Softys, a subsidiary of Chilean tissue group CMPC, has acquired family-owned Brazilian tissue and diaper producer Sepac, for 1.3 billion reais (\$330 million), creating the largest company in the segment in the country. Sepac was founded in 1974 and owns brands such as Duetto, Paloma, Stylus and Maxim. The company has an annual production capacity of 135,000 tons of tissue paper on 6 paper machines in a mill in the state of Paraná, the company also produces 175 million diapers per year on one diaper conversion line.

"The merger of the two companies will consolidate Softys as the largest operator of the tissue industry in Brazil, highlighting Sepac's presence in the south of the country that is complemented by Softys' current relevance in the central states," said CMPC in a statement.

"This is an operation consistent with our goal to grow in markets with high development potential for the tissue business, such as Brazil," said CMPC Group Chairman Francisco Ruiz-Tagle in the statement.

Softys has been in Brazil since 2009

and has operations in São Paulo, with a capacity to produce 145,000 tons of tissue paper that will rise to 280,000tpy after the merger with SEPAC.

OL Papéis Santana Fair starts up Hergen tissue machine

OL Papers has started up a new Hergen-supplied tissue machine, PM3. The machine has a speed of 1,300 m/min, a trim width of 2,870 mm and produces 45 to 52 tons/day of single sheet, double sheet, and towel paper, with weights ranging from 14.5 to 21 g/m².

Start-up is scheduled for October 2020.

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Digital Innovation

is shaping the future of manufacturing

Carol Dib, Editor-in-Chief



Dr. Bahaa Roustom, Deputy Head of Marketing & Business development at CSEM, Switzerland.

In a fast-changing world the need to embrace innovation in digital technology from the side of manufacturers is becoming a must. However, there is still some reluctance to adopt this path for fear of the unknown. To tackle this topic MET Magazine met with Dr. Bahaa Roustom, Deputy Head of Marketing & Business development at the Swiss Research and Technology Organization CSEM. In this interview we discussed the advantages of implementing digital technologies in manufacturing processes and how a digital transformation could affect the tissue industry.

There's a hype today around digitization, digitalization, and digital transformation, maybe we can start by clarifying what each of these mean to the manufacturing industry?

Dr. Bahaa R.: Great place to start! Digitization and Digitalization are often used interchangeably while they have very distinct meanings: Digitization is the process of converting physical or analog information into a digital format. It has become today an integral and “normal” part of our daily life and is already very common in industries, to the extent that I can safely say that the term “digitization” is becoming obsolete in advanced economies, and soon too, globally. On the other hand, Digitalization is the use of digital technologies to create new products, services and business models. We will try to explain this further later on. Last but not least, Digital Transformation of a business consists of integrating digital technology into all areas of the business which will radically change how it operates and delivers value to its customers. A company can state that it has digitally transformed its business, when 50% of its revenues in 5 years' time will derive from customers who did not exist prior to this transformation.

How do you see the impact of digitalization on manufacturing?

Dr. Bahaa R.: I believe that digitalization is on its way to disrupt the manufacturing industry. 3D printing, advanced robotics, advanced manufacturing, and IIoT (Industrial Internet of Things) are completely reshaping the future of manufacturing, more specifically, “making” the future of manufacturing. Today adopting digital technologies is an existential affirmation. Either you innovate or you die.

Where does digitalization stand in comparison with the third industrial revolution?

Dr. Bahaa R.: The third industrial revolution drastically changed the industrial sector by integrating automation in the manufacturing process, or in other words assigning to machines the tedious/monotonous and even precision tasks that human workers used to do. It also contributed to simplifying processes and flows, upscaling production, and automatizing processes to enter the era of the so-called “mass

production” where we moved from customized to unified products. However, the fourth industrial revolution that is well underway has been having a tremendous impact on business and society, by : 1) fusing together the digital, physical and biological worlds, 2) bringing intelligence to machines that became smarter than operator, 3) transforming business operations and business models, and 4) revealing the unlimited potential of data. Some examples include cyber physical systems, Artificial Intelligence, and IoT. This will bring us back in one way or another to the initial routes, offering again the possibility to mass-produce customized products and components by using new technologies or leveraging digital technology.

How does it apply within the framework of new technologies?

Dr. Bahaa R.: Let us take a simple example; 50 years ago, if you wanted to buy a new outfit, you would go to a tailor who would take all your measurements in order to make an outfit that is the perfect fit for you. If another customer shows up, the tailor would have to repeat the same process again. Since the third industrial revolution, automation has allowed mass production based on pre-defined criteria and standards, whereby the same machine can make thousands and thousands of outfits on the basis of “one mold fits all” concept, to be worn by very different customers. Nowadays augmented/virtual reality, smart/additive manufacturing, advanced robotics, and cloud computing are revolutionizing this approach, allowing the delivery of customized outfits to thousands of people.

In what concerns the tissue industry, what is the real impact of digitalization?

Dr. Bahaa R.: The tissue industry has often been considered to be growing at a slow pace amidst pressure facing producers that are “stuck in the middle”: pressure from suppliers with increased cost of raw materials, as well as pressure from the market concerning competitive pricing. The growing consensus about sustainable manufacturing and sustainable consumption isn't helping producers neither. Nevertheless, there is room for innovation that could bring more cost optimization and diversification to enter new markets. A new report of

Mckinsey¹ stated that by embracing digital technology, producers could reduce their cost by 15 percent. One of the examples used in the report is “forestry monitoring using drones” and “remote mill automation” that carry remarkable opportunities to increase efficiency and reduce cost. In addition, using big data analytics, predictive maintenance and computing technologies will also help the industry to better optimize its processes (we can now find several cases where industries started the Digital Twin technology). These can also help industries become more agile on the supply/demand curve, and improve their ability to create new business models. We should not forget that there is also a tremendous opportunity for diversification.

Sustainability concerns could have a positive impact on the industry and drive tissue companies to explore new business areas such as packaging, knowing that tissue causes significantly less environmental damage than plastic. This can be achieved either:

- Without huge CapEx investment and simply by using existing equipment in several others application.
- With CapEx investment by acquiring additive manufacturing equipment that could help bring smart/bio/functional systems in the industry

Does this mean that every employee in the tissue industry should become a digital expert?

Dr. Bahaa R.: Not Digital experts but maybe digital-friendly professionals; for sure the industry will need more IT engineers, more data analytics and of equal importance, re-educating the people involved in the production. But the transition could be very soft. The only must is to have a management team with a clear vision of their digital transformation strategy, and ability to handle the everyday challenging (and often unexpected) plans. “Open Innovation” should also be considered as an essential step in digital transformation; companies have to build a complete digital innovation ecosystem where they collaborate with suppliers, partners, and customers. This will be more than essential.

¹ <https://www.mckinsey.com/industries/paper-and-forest-products/our-insights/pulp-paper-and-packaging-in-the-next-decade-transformational-change>

Pulp, paper, and packaging in the next decade:

Transformational change

If you thought the paper industry was going to disappear, think again. Graphic papers are being squeezed by digitization, but the paper and forest-products industry overall has major changes in store and exciting prospects for new growth.

by **Peter Berg**, director of knowledge, McKinsey's Stockholm office and **Oskar Lingqvist**, senior partner, McKinsey's Stockholm office together they lead McKinsey's global Paper & Forest Products Practice.

From what you read in the press and hear on the street, you might be excused for believing the paper and forest-products industry is disappearing fast in the wake of digitization. The year 2015 saw worldwide demand for graphic paper decline for the first time ever, and the fall in demand for these products in North America and Europe over the past five years has been more pronounced than even the most pessimistic forecasts.

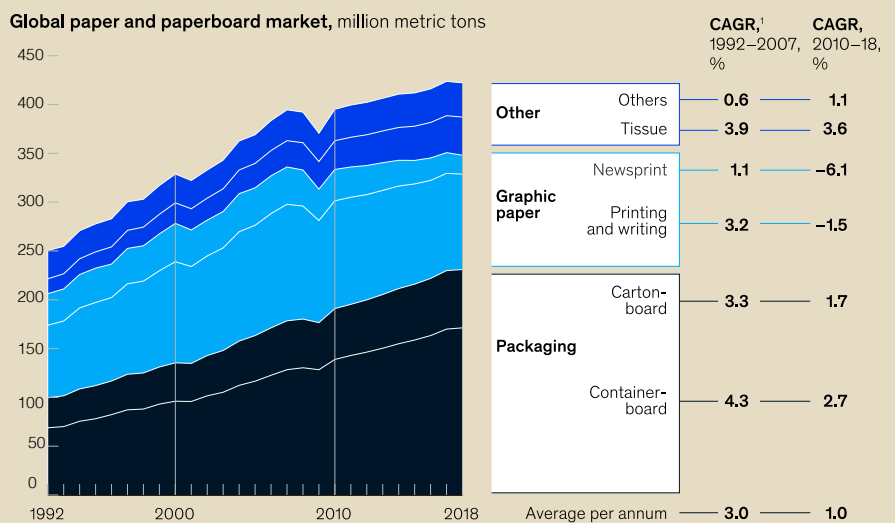
But the paper and forest-products industry as a whole is growing, albeit at a slower pace than before, as other products are filling the gap left by the shrinking graphic-paper¹ market (Exhibit 1). Packaging is growing all over the world, along with tissue papers, and pulp for hygiene products. Although a relatively small market as yet, pulp for textile applications is growing. And a broad search for new applications and uses for wood and its components is taking place in numerous labs and development centers. The paper and forest-products industry is not disappearing—far from it. But it is changing, morphing, and developing. We would argue that the industry is going through the most substantial transformation it has seen in many decades.

In this article, we outline the changes we see happening across the industry and identify the challenges CEOs and their leadership teams will need to manage over the next decade.

¹ The graphic-paper segment includes newsprint, printing, and writing papers.

Exhibit 1

The global paper and paperboard industry continues to grow despite decline in the graphic-paper segment.



¹Compound annual growth rate. Source: Resource Information Systems Inc (RISI), Feb 2019

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Changing industry structure

The structure of the industry landscape is changing. The changes are not dramatic individually, but the accumulation of changes over the long term has now reached a point where they are making a difference. Consolidation has been a major factor in many segments of the industry. The big have become bigger in their chosen areas of focus. At the aggregate level, the world's largest paper and forest-products companies have not grown much, if at all, and several of them have reduced in size. What they have done is focus their efforts on fewer segments. As a result, concentration levels in specific segments have generally, if not universally, increased (Exhibit 2). In some segments such as North American containerboard and coated fine paper, ownership concentration as defined by traditional approaches to drawing segment boundaries may be reaching levels where it would be difficult for companies to find further acquisition opportunities that could be approved by competition authorities.

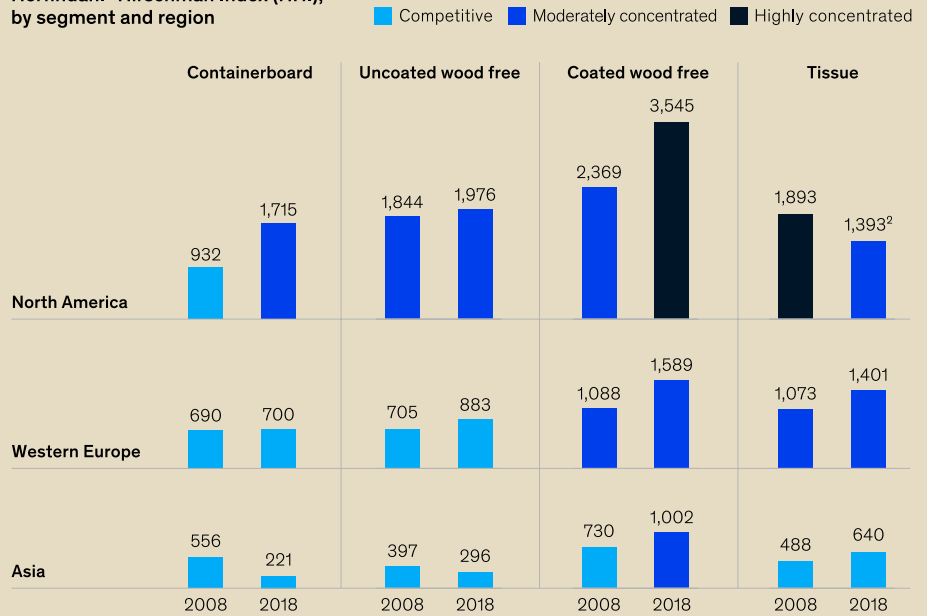
A grouping of companies has emerged that is not identical to, but partly overlaps with, the group of largest companies, and is drawn from various geographies and market segments. Companies in this group have positioned themselves for further growth through high margins and low debt (Exhibit 3). Our analysis suggests the financial resources available to some members of this group for strategic capital expenditure could be five to ten times greater than other top players in the industry. This potentially represents a powerful force for change in the industry, and over the next few years it will be interesting to see how these companies choose to spend their resources. Some of these companies with large war chests and sizable annual cash flows deployable for strategic capex might even face a challenge to find opportunities on a scale that matches these resources.

Where there are leaders, there are also laggards. We believe the pronounced differences in performance among companies across the industry continues to pique the interest of

Exhibit 2

Segment concentration has increased over the past ten years in most segments.

Herfindahl–Hirschman Index (HHI),¹ by segment and region



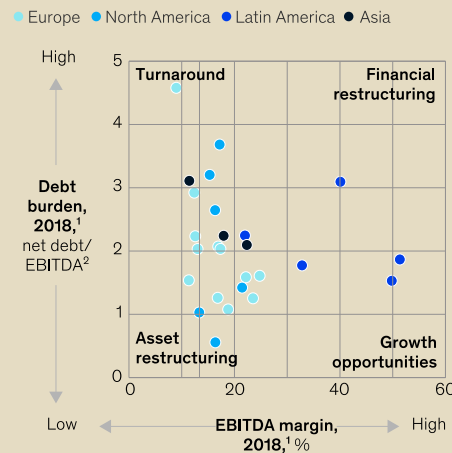
¹(market share)², HHI <1,000 competitive, 1,000–1,800 moderately concentrated, >1,800 highly concentrated.
²At the next level of granularity, consumer tissue and away-from-home tissue are highly concentrated segments (HHI ~2,500).
 Source: Brian McClay & Associates; Resource Information Systems Inc. (RISI); McKinsey analysis

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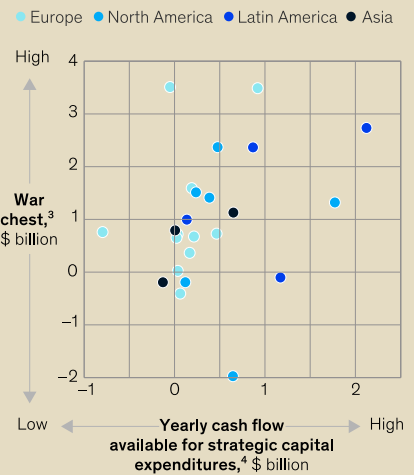
Exhibit 3

Pulp-and-paper companies are building up significant muscle for structural actions and further growth.

Performance and financial strength



Growth potential



¹Based on full-year 2016 or latest available interim report, excluding nonrecurring items.
²Earnings before interest, taxes, depreciation, and amortization.
³Indicates further debt potentially to be used in expansion assuming net debt/EBITDA may not exceed 3.
⁴EBITDA less maintenance capital expenditures (assumed 4% of sales), less assumed change in assumed working capital, less tax, less dividends and financial costs.

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investors and private-equity players in an industry that is already undergoing substantial restructuring and M&A.

Changing market segments

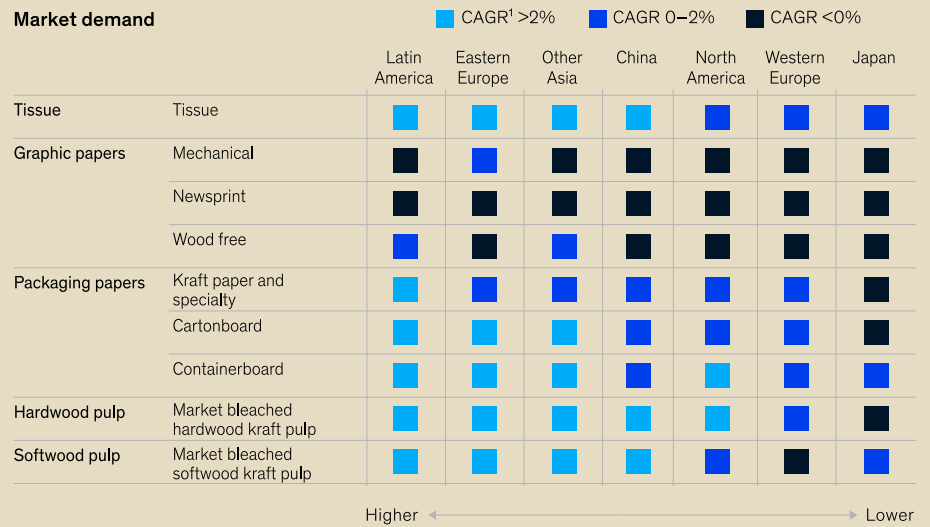
Whether companies are well positioned for further growth or still needing to earn the right to grow, they can expect demand to grow for paper and board products over the next decade. The graphic-paper market will continue to face declining demand worldwide, and our research has yet to find credible arguments for a specific floor for future demand. But this decline should be balanced by the increase in demand for packaging—industrial as well as consumer—and tissue products. All in all, demand for fiber-based products is set to increase globally, with some segments growing faster than others (Exhibit 4).

That picture is not without its uncertainties. One hazy spot in the demand skies might be concerns over how fast demand will grow in China. Expectations of growth from only a few years ago have proved a bit too optimistic, not only in graphic papers but also in tissue papers and packaging. And recently, as a result of turmoil in the market for recycled fiber, Chinese users of corrugated packaging have reduced their consumption, through weight reductions and use of reusable plastic boxes. Given China's weight in the global paper and board market, even relatively modest changes can have significant impact. How these demand trends will translate into industry profitability will of course be heavily influenced by the industry's supply actions. Supply movements are notoriously difficult to forecast more than a few years out, but we believe the following observations are relevant to this discussion.

- **Graphic papers**, particularly newsprint and coated papers but also uncoated papers, will continue to face a severe decline in demand and significant pressure to restructure production capacity. We are likely to see continuing machine conversions into packaging and specialty papers, as well as more innovative structural moves that include

Exhibit 4

Growth prospects in pulp and paper vary significantly among segments and regions.



¹ Compound annual growth rate. Source: Resource Information Systems Inc. (RISI), Feb 2019

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innovations in distribution and the supply chain. Such structural changes are already having an impact and the profitability of graphic-paper companies has reemerged from several years in the doldrums. The turbulence in graphic papers has meanwhile spilled over to packaging and tissue segments, with capacity increases in segments that don't really need it.

- **Consumer packaging and tissue** will be driven largely by demographic shifts and consumer trends such as the demand for convenience and sustainability. It will grow roughly on par with GDP. We expect innovation to be a critical success factor, particularly in light of recent concerns over plastic packaging waste, which could harbor both opportunities and challenges for fiber-based consumer packaging. But we are uncertain how far packaging players can drive innovation by themselves. Clearly, they can take the lead on materials development, but they may need to follow the lead of—and cooperate with—

retailers and consumer-goods companies in areas such as formats, use, and technology. At the same time, the inflow of capacity from the graphic-paper segment will need to be managed.

- **Transport and industrial packaging** will also see opportunities for innovation and a certain amount of value-creating disruption in the intersection between sustainability requirements, e-commerce, and technology integration. We estimate that e-commerce will drive roughly half of the demand growth in transport packaging over the next several years. As packaging adapts to this particular channel, it will have to find new solutions to a variety of issues, such as how to handle last-mile deliveries, the sustainability choice between fiber-based and lightweight plastic packaging, and the potential merging of transport (secondary) and consumer (primary) packaging, to name but a few.

- **Fiber** has gone through some turbulent times in the past two years, largely to the delight of pulp producers and to the chagrin of users. Hardwood and softwood prices alike have seen steady increases since 2017, due to some slow start-up of capacity (hardwood pulp), limited capacity additions, and a certain measure of industry psychology. In the past two years, prices globally went through what we would term a “fly-up regime,” whereby prices are significantly and unusually higher than the cost of the marginal producer. Such situations, seen from time to time in many other basic-materials industries, are rarely long lived. Indeed, since the beginning of 2019, prices have come down—in China drastically so.

But even with a readjustment of the market, the midterm prospects are likely to be in favor of the producers, with little new capacity until 2021–22 and some softwood capacity that is likely to be converted to other products, such as pulp for textile applications. For softwood particularly, challenges in expanding the forest supply are constraining new supply. Also, the fact that much of the industry’s softwood-production assets are aging and need complete renewal or substantial upgrades could further contribute to scarcity, especially since the scale of the investments required is a potential roadblock to them being made.

The lingering question is whether such supply-side challenges can trigger an accelerated development of applications that are less dependent on wood-fiber pulp.

Challenges for the next decade

In such an environment, what are the key challenges senior executives will need to address? What are the key battles they will have to fight? The paper and forest-products industry is often labelled a “traditional” industry. Yet given the confluence of technological changes, demographic changes, and resource concerns that we anticipate over the next decade, we believe the industry will have to

embrace change that is, in character, as well as pace, vastly different from what we have seen before—and anything but traditional. This will pose significant challenges for CEOs regarding how they manage their companies. We argue that there are three broad themes that paper and forest-products CEOs will have to address through 2020 and beyond:

- Managing short-to-medium-term “grade turbulence”
- Finding the next level of cost optimization
- Finding value-creating growth roles for forest products in a fundamentally changing business landscape

Managing short-to-medium-term ‘grade turbulence’

The past couple of years have seen increased instability in forest-products segments. The negative impact of digital communications on graphic paper has led many companies to steer away from the segment and into higher-growth areas, either through conversion of machines or through redirection of investment funds. This is leading to a higher level of uncertainty and overcapacity in, for example, packaging grades. The instability has also been exacerbated by the capacity additions that primarily Asian producers have made despite the slowing demand growth in that region.

A case in point is virgin-fiber cartonboard. Several producers in Europe have converted machines away from graphic paper and into this segment, creating further oversupply in Europe and leading producers

to redouble their efforts to sell to export markets. This is happening just as increasing capacity in Asia, and particularly in China, looks set to displace imports that have traditionally come into the region, mainly from Europe and North America. Some of the new Asian capacity could even find its way into export markets.

This development is likely to persist for several years until markets again find more of an equilibrium, and it poses challenging questions for companies. What, if any, safe havens exist for my products? How do I protect home-market volumes? How do I protect my export volumes? What is the appropriate pricing strategy to use in the different regions?

For CEOs looking to move into a new market segment, it will be equally important to make the right assessment of which segments to enter as they shift their footing. Where will I be the most competitive? How will my entry change market dynamics, and will this matter to me?

On the raw-materials (fiber) side, we have already described the past couple of years’ turbulence in virgin pulp. If that might seem to trend toward stabilization, the situation in recycled fibers is still very uncertain. As China, and gradually other Asian countries, have increasingly restricted the import of recovered fiber (as well as plastics and other recovered materials), the dynamics have shifted. While prices of old corrugated containers (OCC) and other papers for recycling have plummeted in North America and Europe, prices of domestic Chinese OCC have increased drastically, challenging both the price and availability of recycled-based corrugated board. In response, companies have set up capacity to produce recycled-fiber pulp to export to China, while the country is jacking up its import of containerboard for corrugated packaging, as well as virgin fiber for strengthening purposes.

This of course affects how companies, in any country, think about their fiber-supply strategies as well as their product focus.

We believe the industry will have to embrace change that is, in character, as well as pace, vastly different from what we have seen before—and anything but traditional.

Finding the next level of cost optimization

Even though we see new ways of creating value in the forest-products industry, low cost is, and will remain, a critical factor for high financial performance. One of the characteristics shared by companies with high margins and high returns is that they have access to low-cost raw materials, primarily fiber. This will continue to be a high-priority area, albeit with some twists compared with today.

Beyond the price increases of the past couple of years, fresh fiber is facing other, more long-term, cost issues. It is unclear whether plantation land in the southern hemisphere (primarily for short-fiber wood) will continue to be available at current low prices. And as companies go to more remote areas to acquire inexpensive land, such as in Brazil, their infrastructure and logistics costs increase. Will higher productivity and yield allow the global industry to add ever more low-cost capacity, or are we going to see a gradual increase in raw-material costs? For long-fiber products, the difficulties to expand long-fiber pulp capacity will make such assets very valuable over the next several years. But at what point will development of the material properties of short-fiber pulps make them rival more expensive long-fiber pulps in a number of major applications?

Operating costs for paper and board production are another area where companies need to get a tighter grip. Despite the fact that this area receives continual focus from management, our experience suggests there is still significant potential for cost reduction by using conventional approaches to work smarter and reduce waste in the production chain. This is particularly the case in areas that are less the focus of management attention, such as converting.

Many companies need to go beyond the conventional approaches to a next level of cost optimization—and many are ready to take this step. Most if not all paper and forest-products companies have completed large fixed-cost reduction programs. But there are often broader systemic issues that companies still need to address to

Exhibit 5

A rough estimation shows the paper and forest-products industry has much to gain from embracing the digital revolution.

Example use cases in the paper and forest-products industry	● Raw-material supply ¹ ● Pulp production ● Paper and board production ● Paper machine ● Converting line	Cost reduction on total cost base, estimate, %		OEE ² improvement, estimate, pp ³
		Existing technologies	Existing and future technologies	Existing technologies
Artificial intelligence and analytics	Fiber yield, chemical consumption, and energy	~4.5	~7.0	n/a
	Predictive maintenance	~2.0	~2.5	~2.0
	Throughput debottlenecking and quality	n/a	n/a	~3.0
Automation	Logistics automation	~0.5	~1.0	n/a
	Process automation	n/a	~0.5	n/a
	Remote process control	n/a	~1.5	n/a
	Remote process inspection	~1.0	~1.0	n/a
	Digital field-force apps	~1.0	~1.0	n/a
Mobile	Digital business-support functions	~0.5	~0.5	n/a
	Digital performance management	n/a	n/a	n/a
Total opportunity ⁴		~10	~15	~5

¹Forestry and harvesting.

²Overall equipment effectiveness.

³Percentage points.

⁴Not including purchasing, marketing and sales.

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By radically rethinking the operating model, companies can significantly shift their fixed-cost structure.

be able to build sustainable operating models. In addition, in some segments many companies fail to reduce fixed costs as quickly as capacity disappears. By radically rethinking the operating model, companies can significantly shift their fixed-cost structure. By doing so, they can set a very different starting point in terms of flexibility and agility for when market volumes go through their normal cyclical swings.

The paper and forest-products industry has much to gain from embracing digital manufacturing: according to our estimates, this could reduce the total cost base of a producer by as much as 15 percent. New applications such

as forestry monitoring using drones or remote mill automation present tremendous opportunities for increased efficiency and cost reductions. This is also the case in areas where big data can be applied, for instance, to solve variability and throughput-related issues in each step of the integrated production flows (Exhibit 5). The industry is well placed to join the digital revolution, as paper and pulp producers typically start from a strong position when it comes to collected or collectable data.

At the customer-facing end, the opportunity for innovation is huge and has the potential to transform existing industries and create new ones, especially in packaging

segments. Digital developments will also help disrupt previous B2B2C value chains, paving the way for direct B2C relationships between paper-product makers and end consumers, for example, in tissue products.

The digital world is unfamiliar territory to most paper industry CEOs. To avoid too much doodling with small uncoordinated efforts, it is necessary to undertake a thought-through program, preferably guided by digitally experienced people either on the top-management team or board.

Finding value-creating growth roles for forest products

For any paper-company CEO who looks out ten years, the really different challenges will not be around cost containment. Global trends are moving the industry into a new landscape, where the challenges and opportunities for finding value-creating growth roles for forest products are changing radically. For example, the industry's historic linear value chains are giving way to more collaborative structures with players in and outside the industry. We believe examples will include new producer and distributor collaborations; pulp players collaborating more innovatively with non-integrated players; paper and packaging companies collaborating more intensively with retailers, consumer-goods companies, and technological experts; and new products such as bio-refinery products requiring novel go-to-market partnerships. Here are some interesting examples of how these and other trends could play out.

Staying relevant (and increasing relevancy) in a fast-changing packaging world. The packaging market is multifaceted and continuously morphing. Digital developments influence it both by stimulating demand for packaging used in e-commerce and by enabling the integration into packaging of sensors and other technology. E-commerce has highlighted new packaging topics such as improved product safety, the “un-boxing” experience, counterfeiting measures, optimization for last-mile delivery, and a growing interest—at least from the large e-commerce-based retailers—in the possibility of merging primary and secondary packaging. At

the same time, the packaging industry has to deal with increasing pressures around cost, resource conservancy, and sustainability. That last topic has gained huge momentum in the past couple of years as concerns over plastic waste have added to the concern over CO2 emissions from fossil-based packaging materials. Consumer-goods companies, retailers, packagers, and policy makers alike are now exploring a wide range of possible solutions for what tomorrow's packaging will look like.

The opportunity for forest-products companies to develop a differentiated and distinct customer value proposition in this landscape has never been greater. Packaging-materials CEOs will have to address a number of choices and trade-offs as they seek the appropriate strategic posture. Should you be a pure upstream player or a packaging-solutions provider? Should you focus on fiber-based packaging only or providing multi-substrate solutions? Should you be at the forefront of technology integration and application development in packaging or focus on materials development?

To stay relevant, many companies in packaging are trying to move closer to the brand owner or end user. Only a few companies are positioned to successfully make this move, however, and even they should be cautious. We are already seeing brand owners and leading customers challenging the benefits of packaging companies coming with consumer-facing ideas such as complete packaging concepts. Some of these players would prefer packaging companies to focus instead on core competencies such as materials development or interfaces with other substrates such as plastics.

Finding the right path in next-generation bio-products. Wood is a biomaterial with exciting properties, from the log on down to fibers, micro- and nanofibers, and sugar molecules. A healthy niche industry making bio-products has existed for many years alongside large-volume pulp, paper, and board products. We are in the midst of an explosion of research activity to develop new bio-products, ranging from applications for nanofibers to composite materials and lignin-

Digital developments will also help disrupt previous B2B2C value chains, paving the way for direct B2C relationships between paper-product makers and end consumer.

based carbon fiber. New processes are being designed to extract hemicellulose as feedstock for sugars and chemical production while still keeping the cellulose parts of the wood chip for pulp products.

We believe wood-based products will find new ways to enlarge their footprint in a more sustainable global economy. But the challenges are legion, particularly for finding cost-effective production methods that can withstand competition not only from oil-based materials but also from other biomaterials. Finding the right balance between developing the “new” and safeguarding the “old” will be a crucial undertaking for executives running companies with access to fresh fiber.

Finding growth in adjacent areas.

Over the past decade or two we have seen the larger forest-products companies performing a focus adjustment. Most companies have moved from being fairly broad conglomerates present in various forest-products segments to focusing on a few core businesses. To find value-creating growth in the next two decades, we expect companies to start broadening their corporate portfolio again, but broadening it around the core businesses they have been working on, so as to create differentiated customer value propositions. Finding value-creating adjacencies to the core business will be a challenging exercise in creativity and business acumen for executive teams.

Finding new value-creating growth for forest products will also put the spotlight on a number of functional executive topics. We believe the following will be most important.

- **Innovation:** The forest-products industry has not been known for a fast-paced innovation agenda. By and large it hasn't been necessary, as markets and demand characteristics have changed relatively slowly. In the future, however, innovation in products, processes, organizational setup, and business models will be imperative. For many companies, getting efficient innovation practices and organization up to speed will be an important challenge.

One particular war-for-talent battle that can become a key differentiator is the content of work. Our research on the future of work highlights that already today, around 60 percent of all tasks, that is, not entire jobs or roles but their components, can be automated. And looking to the coming ten to 15 years, more than 30 percent of physical and manual skills risk becoming obsolete while technological skills will continue to grow very quickly. This will provide a critical and likely success-defining reskilling challenge for companies in the industry.

We believe the paper and forest-products industry is moving into an interesting decade, one that will see nothing less than a transformation of large parts of the industry. There will be many barriers to overcome and metaphorical cliffs to fall off. But the companies that are able to navigate through successfully can look forward to an industry that has a new sense of purpose and an increasingly vital role to play.

- **Talent management:** The different skills required over the next ten to 15 years, dictated by developments such as new business models in an online world, increased need for innovation and commercialization of products, and digitalization's impact on everything from manufacturing processes to the content of work will put particular onus on the talent pool of forest-products companies. Installing an executive team that is able to understand new demands across customer businesses, digital, bio-products that cater to completely different value chains, and cross-industry collaboration will be a major task for CEOs and boards.

- **Commercial excellence:** Paper and forest-products companies will need to transform their commercial interface to stay relevant, particularly in packaging and downstream paper. They will need to put in place a more professionalized and skilled organization that focuses on value creation instead of focusing primarily on sales volumes.

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Circularity in tissue business

How to integrate sustainability principles in manufacturing

Companies have taken strides responding to global trends of environmentally conscience consumers. Driven by institutional and governmental regulatory framework, we are seeing real change in terms of investment in sustainable solutions and mitigation measures.

Dana El Sanioura, Contributing Editor

In our previous piece of this two-part series, we discussed the need for sustainability in the industry and the subsequent need for integrating circular economy approaches to mitigate environmental challenges facing the tissue paper industry. In our current article, we will look into available techniques currently used. We will end by sharing best available practices in integrate circular economy approaches as well as cite examples from key industry players who are getting ahead of curve.

The European Federation of Corrugated Board Manufacturers reported that between 2005 and 2015, forested areas in the continent increased by 44,000 km² an area equivalent to the country of Denmark

A green thumb goes a long way

Favoring the use of sustainable resources

The relative sustainability of pulp and paper is complex and depends on the region from where the raw material is coming. Increased demand of forestry resources is not surprisingly matched by the agro-industry reporting growing forest surfaces (mostly plantations) in both the European continent and North America (NA). Strict forestry management and regulation framework by the EU, means that only wood from sustainable sources is permitted to enter the EU supply chain. Likewise, in North America certification schemes have been set up with strict chain of custody procedures.

The European Federation of Corrugated Board Manufacturers reported that between 2005 and 2015, forested areas in the continent increased by 44,000 km² an area equivalent to the country of Denmark^{2,3}. Similarly across the pond, during the same period, the industry group Two Sides says that forests in the US grew by over 50,000 km², an area twice the size of Maryland (Figure 1). Yet, the situation on the ground is

slightly different with continuous expansion of logging into ancient and endangered boreal forests in NA. While in the tropics, Pulp and Paper plantations continue to drive deforestation.

An increased demand for Pulp and Paper seems likely to stress supply chains from sustainably-managed forests, so eyes are turning to more sustainable sources of fiber. One unconventional candidate is the fast-growing Bamboo; a grass species that has the potential to provide durable building material and strong fiber for paper and textiles without the need to fell trees. Unlike trees which may take decades to grow and harvest, bamboo shoots grow back quickly after being harvested – making it a highly sustainable product in the paper market. The plant is being endorsed by the Food and Agriculture Organization (FAO) of the United Nation as a potential substitute across several industries with little impact on soil, land management, and erosion⁴.

Not surprisingly, the majority of bamboo pulp producers are located in South Asia, Southeast and East Asia, where the native plant grows in the warm tropical and temperate climatic zone (see Figure 2 for market share).



Figure 1: Illustration of increased forested area in Europe and the US

¹ MET Magazine Issue 43 Apr/May/June 2019.

² Innovation Forum (2019) Packaging drives pulp's deforestation risks. Available on <https://innovation-forum.co.uk>.

³ Sans Greenland

⁴FTA (2018) "Standing tall: Bamboo from restoration to economic development." By Hannah Maddison-Harris, FTA Communications and Editorial Coordinator. Available on <http://www.foreststreesagroforestry.org>

Sustainable Intensification

Pulp sourced from plantations is directly saving millions of hectares of virgin forests. With the Planet's finite lands and resources, the industry is on the lookout for technological advances and sustainable management

An increased demand for Pulp and Paper seems likely to stress supply chains from sustainably-managed forests, so eyes are turning to more sustainable sources of fiber.

techniques that can increase production with minimal need of additional land, chemical, and water. In comes **Sustainable Intensification**: a broad term for a process or system where agricultural yields are increased from existing farmlands without increasing adverse environmental impact. It is a complex subject, one that can be considered controversial due to the innumerable means used to justify the end. Though, on a planet with finite resources; policymakers, manufacturers, and agricultural engineers are working together to optimize production while minimizing the need for inputs and abating adverse impacts on nature.

Brazilian supplier Fibria, part of Suzano Group, is the world's largest pulp producer. Half of their production is used for tissue products. Despite the high demand, the area of land needed to produce a million-metric ton of pulp has halved in the last 30 years, they have been able to achieve these results through improved pulp mills but mostly by tree breeding. Human aided selective breeding has been happening for millennia; *think wild corn versus the type you find at the supermarket*. Plantation trees are developed in companies' labs and nurseries, and the best performing varieties are selected to breeding. Additionally, lands are quickly replanted after harvest to avoid soil erosion and to make use of nutrient rich humus created by leaves and branches from the previous generation⁵.

Market Share of China's Bamboo Pulp Producers in 2019

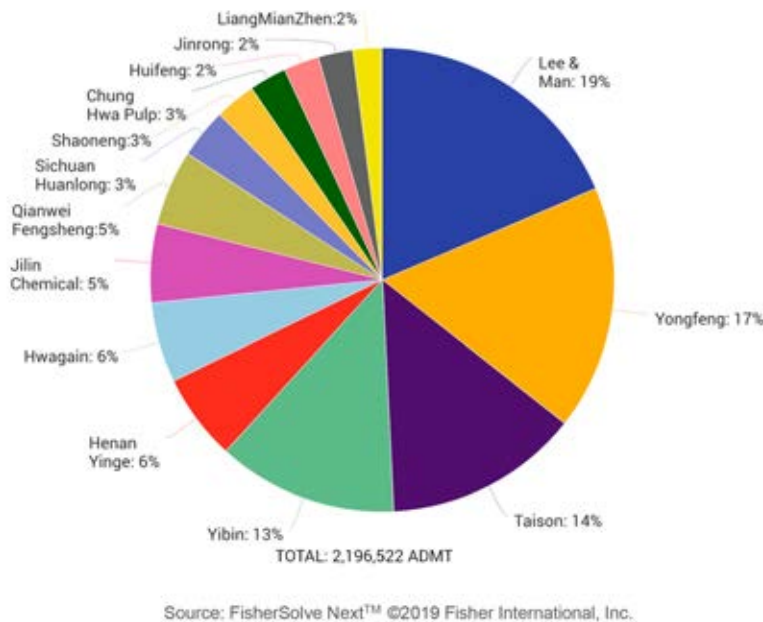


Figure 2: Market share distribution of China's Bamboo pulp producers. Source FisherSolve Next™, copyright 2019 Fisher international, Inc.

⁵ New Generation Plantations (2018) Tissues and Technology: Sustainable intensification from pulp to plastics. Available on: <https://newgenerationplantations.exposure.co/>

Green engineering, chemistry, and origami

Minimum Impact Mill technologies

As discussed in our previous article, the production of pulp and paper is the source of multiple emission sources. Driven by governmental incentives and encouraged by the promise of improved production and decreased generation of secondary products, the Minimum Impact Mill (MIM) is a technological concept that mitigates the environmental challenges of the industry is facing (see Figure 3).

This is not to say that the MIM is the Holy grail of technologies: there is an obvious difference between minimum and no-impact. Nevertheless, even though the initial aim of MIM technologies may seem idealistic, companies that are incorporating its different supported technologies and best industry techniques are seeing the difference in their annual revenues. An overview of such techniques is provided in Figure 4.

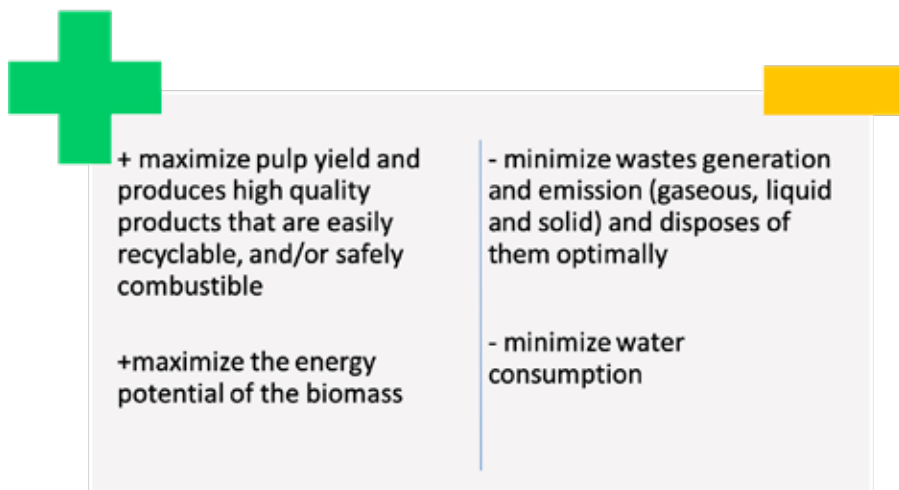


Figure 3: Objectives of implementing MIM technologies

Even though the initial aim of MIM technologies may seem idealistic, companies that are incorporating its different supported technologies and best industry techniques are seeing the difference in their annual revenues.

Optimized wood handling	Extended Modified cooking	Ozone bleaching	HexA Removal	Incineration of odorous gases in the lime kiln	Installation of low NOx technology in auxiliary boilers and the lime kiln	SNCR on bark boilers
Dry Debarking	Efficient Brownstock Washing/Improved Pulp Washing	ECF and TCF bleaching	Condensate Stripping and Recovery	Over Fire Air Technique on recovery boilers	Efficient Primary, Secondary and Tertiary Waste Treatment (in some special cases)	Partial system closure
High Yield Pulping Process	Oxygen Delignification	Fortification of extraction stages with oxygen and hydrogen peroxide	Installation of scrubbers on the recovery boiler	Installation of improved washing of lime mud in recausticizing	Minimum Power Consumption	Waste water Recycling and reuse

Figure 4: MIM technologies (Source: Bajpai P.,2015)⁶

⁶Bajpai P. (2015) Minimum Impact Mill Technologies. In: Green Chemistry and Sustainability in Pulp and Paper Industry. Springer, Cham

Resorting to Green Chemistry

In continuing with the theme of improved technologies, some are saying that the Pulp and Paper industry is currently witnessing its next evolution: Green Chemistry. Back in 1998, the principals of green chemistry were established by Paul Anastas and John C. Warner who addressed ways for to reduce the environmental and health impacts of chemical processes through the development of green chemistry technologies (See Figure 5). Lately, the practicality of the Principles has been very influential in production and innovation choices. Canadian scientists have been especially active in this field, with 700 publications in 2017-2018 by the Centre in Green Chemistry and Catalysis (CGCC) members (Gaudreault, 2019)⁷.

Eco-design of packaging

The shift in the desired packaging in the Fast-Moving Consumer Goods (FMCG) market from cost driven to a more strategic resource conscience approach is surely giving the Pulp and Paper industry a boost. Growth in e-commerce sector in the last decade is positively influencing the packaging market. Industry giant, Amazon, saw its annual sales in 2016 exceed USD 136 billion with cardboard packing being the preferred material.

According to Ahuja & Rawat (2017), the global packaging industry is expected to exceed USD 1 trillion by 2021, growing at an annual rate of 3.5%, of which paper packaging is expected to account for over 36% of the overall industry share in 2016⁸. The shift is mainly due to

increasing environmental concerns from the use [or excessive use in some cases!] of plastic bags and packaging material. While the consumer is still expecting the same type of protection of his/her purchases, at the same price point, the packaging industry is looking for more options to respond to the increased demand for sustainable packaging. Sustainable packaging is ultimately the practice of ensuring any material waste from packaged products never leaves the value chain, as well as, using material with little to zero environmental harm (Nymex Consulting, 2018)⁹. Optimizing the design of packaging ideally starts in the raw material used: ensuring that materials used require little to no harmful chemical process to make, and are easily recyclable or reusable into the same product or up-scaled into a better product.

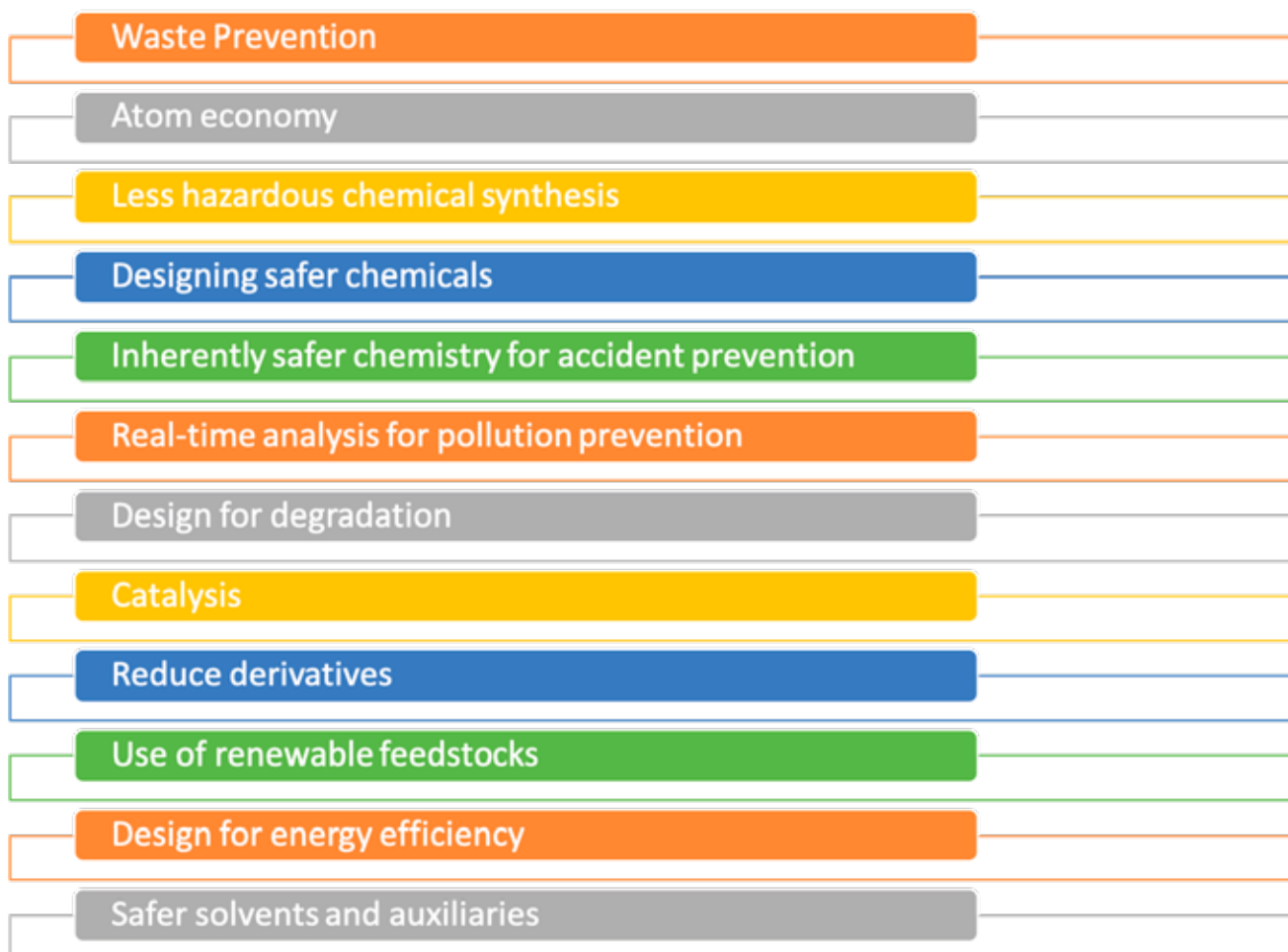


Figure 5: Green Chemistry principles

⁷ Roger GAUDREULT (2019) "GREEN CHEMISTREE: the Pulp and Paper Industry's Next Evolution" Available on: <https://www.paperadvance.com>

⁸ Kunal AHUJA and Amit RAWAT (2017) Pulp & Paper Enzymes Market Size – Industry Share Report 2017-2024. Report ID: GMI1995

⁹ Nymex Consulting (2018) Thoughts Reflexion and Analysis for the Indian Market The FMCG Packaging – A Moving Market. June 2018

Manufacturers should also collaborate closely with their packaging partners to strike the right balance between protecting the product and using the least amount of packaging possible. At the same time, manufacturers should introspectively look into way to optimize their products to reduce the amount of packaging needed in the first place. A good example would be selling the concentrated formula of cleaning liquid to save on the plastic needed for the bottle. Common sustainable packaging trends we are seeing include downsizing the weight of packing material, improved recycling and recovery of waste, and increasing the use of recycled content.

Wrap-up

Best available techniques

An environmental analysis of the EU Ecolabel criteria revision revealed that best practice in paper production stem from an array of practices, which if combined with sustainable consumer behavior may lead to eco-friendlier products. The list of best practices by impact category is presented in Figure 6.

Manufacturers should also collaborate closely with their packaging partners to strike the right balance between protecting the product and using the least amount of packaging possible.



Figure 6: List of best practices by impact category (Source Kowalska et al.,2019)¹⁰

¹⁰Kowalska, Malgorzata & Donatello, Shane & Wolf, Oliver. (2019). EU Ecolabel criteria for Graphic Paper, Tissue Paper and Tissue Products. Final Technical Report. 10.2760/71692.

Examples from the industry

International

Sofidel

As the first Italian manufacturing company and the first tissue paper manufacturer in the world to join the WWF Climate Savers project. Between 2009 and 2017, the company managed to reduce its direct emissions of CO₂ into the atmosphere by 20.6% (carbon intensity reduction) thanks to investments in energy efficiency, use of cogeneration plants, and relying on renewable energy sources. The company is also sourcing the entirety of the pulp used in their production from certified independent third parties with forest certification schemes (FSC, FSC Controlled Wood, SFI, PEFC) (See Figure 7 for company highlights).

Climate Savers is WWF's flagship climate leadership program that seeks to transform businesses into leaders of the low-carbon economy. The intention of the program is to inspire a change in thinking about climate solutions in companies and as agents of change within their sphere of influence. This leaves member companies better placed to avoid carbon-related risks while realizing opportunities within their long-term business strategies.

Sofidel's commitment to sustainable growth was in fact incorporated in the company's 2030 agenda. The strategy was inspired by the United Nations' 17 Sustainable Development Goals, ensuring that the company will undertake an (a) increasingly significant environmental, social and economic role; and (b) meaningful steps to improving the quality of life of all its stakeholders and the communities in which it operates. The company's ultimate goal is to minimize its environmental impact when producing products that contain ever decreasing amounts of natural capital while still improving performance and maximizing economic and social benefits for all its stakeholders.

In 2018, the company hit another milestone, by getting awarded by CDP

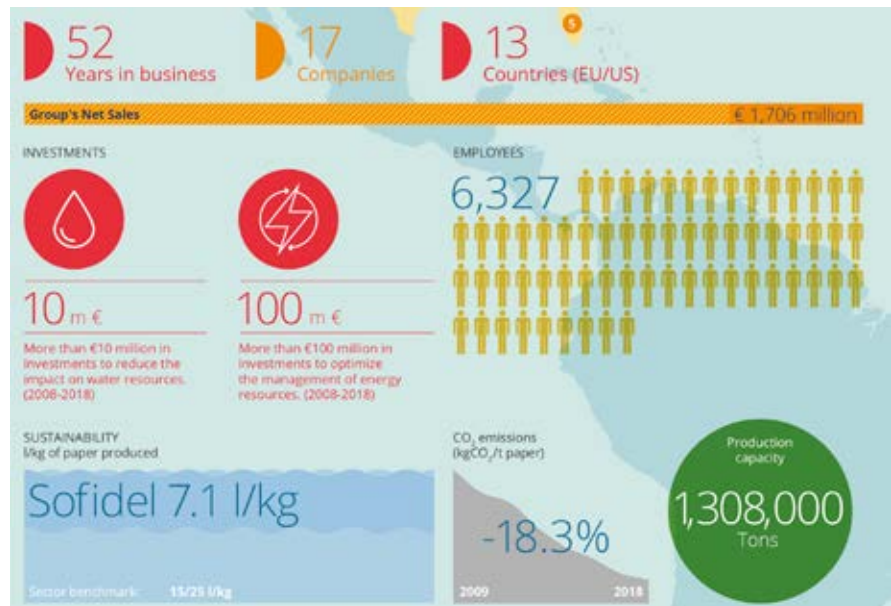


Figure 7: Sofidel in Figures (Source: Sofidel, 2018)

an “A” rating in the **Climate Change** category and another “A” rating in the **Forests Timber** category, in both cases earning a place in the highest (Leadership) scoring echelons of the report. The CDP report (formerly the Carbon Disclosure Project) is a global disclosure system that enables companies, cities, states and regions to measure and manage their environmental impacts. In detail, Sofidel out-performed its fellow peers in the Paper & Forestry sector by ranking among the top businesses in the Climate Change category, above the sector average at global “C” and European “B-” level, and among the top businesses in the Forests Timber category, above the sector average at global “B-” and European “B-” level.

In light of their achievements, CDP awarded Sofidel a position on the leader board of Supplier Engagement on Climate change, the non-profit's global environmental disclosure platform. Among the 5,000 companies assessed by CDP only 3% of organizations were awarded a position on the leader board in recognition of its actions to reduce emissions and lower climate-related risks in the supply chain in the past reporting year.

The matter of closing the loop in the supply chain and managing to integrate the circular economy

approach into a manufacturer requires looking outside the wall of its operations. Greenhouse gas (GHG) emissions in supply chains on are average 5.5 times those of company's direct operations, so no wonder that there has been a step-change in corporate awareness and action on environmental impacts within the supply chain in the last decade. According to the report, in 2018, 115 organizations wielding a combined purchasing power in excess of US\$3.3 trillion, requested environmental information from their suppliers, up from 14 ten years ago. A fact that did not go unnoticed by Sonya Bhonsle, Global Head of Supply Chain at CDP: *“In the ten years that we have been working with purchasing organizations we have seen a fundamental shift in expectations around business action on sustainability”*

Amerplast

Amerplast and Serla (a brand of Sweden's Metsä Tissue) are partnering together to pioneer the first tissue packaging that fully integrates the Circular Economy approach.

The Finnish company Amerplast is already a market mover with their innovative packaging concept: ESSI Kiertokääre (i.e.: ESSI Circular Wrap). The wrap is a polyethylene flexible packaging for non-food and secondary packaging which uses recycled plastic from industrial sources and post-consumer recycled plastic packaging separately collected from Finnish households. The child of the collaboration is Serla's Green Pack packaging which uses a combination of both ESSI Kiertokääre concept and biobased Green PE polyethylene. The latter is bio-plastic made from ethanol (by-product of sugar cane production). Sugar cane is a 100% renewable and carbon dioxide depleting resource, it removes up to 2.15 metric tons of CO2 from the atmosphere for each ton produced (from cradle to grave). More importantly, the Green Pack packaging will contain no fossil raw materials and is fully recyclable through existing recycling streams as raw material for new tissue packaging, thus relieving the pressure on virgin resources and raw material. Founded in 1952, Amerplast is one of Europe's largest flexo printers and bag converters and a leader in sustainable and innovative packaging solutions. With their AmerGreen program, the company is taking a leading position in transforming the flexible packaging industry into an environmentally sound business. While Metsä Tissue with their Serla brand are a leading tissue paper products supplier to households and professionals in Europe and the world's leading supplier of greaseproof papers. So the collaboration of these two leading companies is in fact a promising step into the tissue industry.

Regional

Fine Hygienic Holding (FHH)

In 2019, Fine Hygienic Holding (FHH) further solidified their position as the benchmark for Jordan's manufacturing sector by announcing their partnership with Engicon to design, finance, and build a modular Process Water Treatment Plant (PWTP). In an effort to reduce its fresh water consumption for their Jordan-based operations, FHH chose the module to process wastewater generated by the company's two paper machines, PM2 and PM4, and re-circulate the treated effluents back into the system.

The smartly designed modular water treatment plant the allows rapid adjustment of the capacity through the addition or removal of modules. The design capacity of the plant is 900 thousand cubic meter per day. The module includes tertiary treatment using advanced Ultrafiltration and Reverse Osmosis systems allowing almost 80% of the water coming to the PWTP to be recycled back to the paper machines. The advanced systems ensure the removal of all chemical, biological and physical impurities that may impede the manufacture of the products. As a result, it was possible to replace more than 50% of the fresh water with high quality treated process water. As proof of the company's true commitment to water conservation measures, brine resulting from the Reverse Osmosis will be used to irrigate salt tolerant landscapes within FHH's operation compound in Jordan.

Research and development, Manufacturing base of intelligent equipment for household paper--

China Lucca·jiangxi xiushui

Facial Tissue Folding Machine



**Automatic tissue log transfer
(match to interfolder on the left)**



Model:5T/6T/7T/8T/9T/10T

Max. width of base paper:1350-2100 mm

Folding speed:500-1000 sheets min/line

Start-Stop Model Toilet Tissue Rewinder



OK-250 Type Double Lanes High-speed Handkerchief Tissue Production Line



Packing Speed: ≤250 bags/min

Jumbo roll width:2200/2800mm

Machine's speed:≤200 m/min

Finished roll tissue diameter:φ70-150 mm



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Fabio Perini ecofriendly solutions consolidate its leadership in sustainability



Enrico Zino,
Fabio Perini Head of Marketing

Fabio Perini has always had a green vocation, which in the past prompted the launch on its markets of ecofriendly solutions, even anticipating trends.

In 2010, Fabio Perini was the first company to propose gluefree solutions, barring the use of glue both in lamination (Aquabond) and in the initial pickup of tissue around the core (Web Tuck system Rewinder), reducing environmental impact and saving the cost of glue and the ensuing maintenance; it launched on the market the patented Solid and Solid+ coreless technology to produce full rolls that can keep the product's structural characteristics, increasing by 16% the amount of tissue per roll with the same diameter, and attaining a 10% reduction of packaging required for the same amount of product transported. In addition, Fabio Perini recently presented a series of packaging solutions based on paper coupled with ecologic bioplastics, derived from vegetable starch and waste, creating a product whose characteristics are comparable to those of plastic polymers. This 100% compostable packaging can be

processed maintaining the machinery speed at almost the same speed as with polyethylene production. To all this, Fabio Perini is adding several solutions to limit the energy consumption of its machinery thanks to high efficiency engines and inverters, which consume less and have regenerative feedback capabilities, hybrid energy control-panel cooling, led lights drastically reducing the lighting energy absorption, inside the machines and the control-panels. "The definition of sustainable development dates back to 1987 - Enrico Zino, Fabio Perini Head of Marketing, declares - but while at that time companies who embraced a growth compatible with environmental preservation were doing so by choice, today, as we become aware that our planet can no longer compensate the deep impact of our production and lifestyle, it has become a duty and a responsibility for all. For us at Fabio Perini - Zino concludes - nature and technology represent two sides of the same coin: nature is a perfect technology and our technology must be perfect for nature. We aim at offering, even at industrial level, a more and more sustainable business, by acting as key partners for all the companies that give the utmost priority to environmental compatibility".

Focus

Aquabond: 10th anniversary of eco-friendly water lamination

Ten years have gone by since Aquabond was launched. During this time, Fabio Perini S.p.A. continued researching new state-of-the-art technological solutions for making tissue rolls that improve the final product for consumers, reduce costs for manufacturers, and are environmentally sustainable.

The original idea that formed the basis of the Aquabond system was to find a solution to eliminate glue when laminating the plies while keeping - and improving - the mechanical features and the quality of the final product. This transformation positively and markedly affected environmental sustainability and encouraged the R&D department to develop new technologies to obtain a roll that would use no glue at all.

The year 2013 saw the birth of Glue Free - a series of technologies to grip the core and seal the tail without any kind of adhesive. And this, combined with Aquabond, resulted in a roll 100% made of paper only. Today, after 10 years of testing and developments made with input from Fabio Perini S.p.A. customers, the Aquabond embossing process ensures seamless ply bonding, even at very high speeds.

Efficient production, excellent final product quality, and sustainability. With Aquabond, Fabio Perini S.p.A. is confirmed as a leader in innovation and an industry trendsetter. The secret? Having the insight and foresight to make large-scale investments in Research and Development that's based on having a comprehensive overview of the market, carefully listening to customers' feedback, and implementing a holistic approach to the entire tissue manufacturing process.

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Embracing sustainability thanks to GDM solutions

Conscious consumption goes mainstream

Consumer awareness of sustainability is taking roots over the years, strongly engraving purchasing habits and behaviours. To grasp the scale of this green shift, just consider the 2018 Nielsen report [1] comparing the performance of sustainability claims in the U.S. across three product categories in FMCG, in one year: sales of “all natural”, “fair trade” or “organic” goods have grown 2X faster than their category.

At a global level, the overall shopper sentiment is clear [2]:

- 81% of them think that it is “extremely” or “very” important that companies implement programs to improve the environment
- 30% of them would pay a premium price for products that deliver on socially responsible claims

Consumers would like to use their spending power to effect the change they want to see, preferring manufacturers that:

- **demonstrate that they are taking steps to reduce their environmental impact**
- **are transparent about raw materials they use**
- **share their environmental policies**

Manufacturing companies have therefore a key role because, although people are committed to make a difference, they demand an increasing effort on pressing environmental challenges.

To respond to this call to action, governing bodies worldwide with the **European Commission** in the lead, are implementing precise directives on how to reduce waste and better protect the environment, through concrete policies and legislative acts.

At a cross-border level, the **United Nations** have drawn up the 2030 Agenda for Sustainable Development, nudging consumers and organizations toward a green behaviour, now and into the future. At its heart, the **17 Sustainable Development Goals (SDGs)** point out the action areas for manufacturers to create sustainable strategic plans. Some of the main players in the Disposable Hygiene market have already recognized these goals, engaging in concrete actions such as waste reduction (Goal 12: Responsible Consumption and Production).

Manufacturers' intervention areas targeting sustainability

In the Disposable Hygiene industry, the spotlight is therefore on manufacturers, seeking to embed a sustainable approach within their business objectives. Taking the Sustainable Development Goals as guidelines, **GDM has identified five intervention areas** to reduce the production impact on the environment while generating value through considerable savings:



[1] Nielsen Answers on Demand (Health and Wellness Characteristics) and Nielsen Product Insider, powered by Label Insights)

[2] Source to be put as footnote: Nielsen Product Insider, powered by Label Insights – The Conference Board © Global Consumer Confidence Survey, conducted in collaboration with Nielsen Q2 2017)

SDG 12 - "Responsible consumption and production"

- Waste reduction
- Raw materials

SDG 13 & 15 - "Climate action", "Life on land"

- Energy saving
- Space management – logistics
- Recycle

How are they turning this into reality?
Let's find it out together!

GDM commitment to sustainability

By deeply investigating customers' needs, GDM has developed a machine "Green concept" that puts together all their solutions, propelling sustainability in every step of the manufacturing supply chain.

Raw materials

Less material, better core performances

GDM Extra Thin Core allows to save up to 800 k€ per year: a 40% saving on core materials (fluff & SAP, compared to previous core formation process), thanks to an optimized mix and allocation featuring permanent channels construction, for an outstanding wetness distribution.

Alternatives for core and topsheet

Bamboo, eucalyptus, banana and cotton are driving the raw materials global trend in sustainability: GDM's

converting and packaging solutions are set-up to handle fibers other than from softwoods, more sustainable and with a lower environmental impact.

Waste reduction: Option Zero is your option

Option Zero is GDM's cutting-edge program aiming to minimize any sort of waste in the converting process and to maximize its related savings. According to customers' needs, the focus is on:

Zero Waste: enabling the elimination of trims, thanks to the "zero waste" product design, you can save up to 30% on nonwovens material used in Rear Wings process

Zero Defects: matching market needs for premium quality products, reducing defects costs and boosting sales and earnings

Zero Glue: reducing the total amount of construction glue up to 10%, through ultrasonic bonding technology, GDM can also minimize glue contamination in the final product

Zero Time: you can cut by half your size changeover time, thanks to GDM patented Linear Motion technology, eliminating hardware replacement and set-up

Energy saving: Extra Thin Core saves up to 40% of power consumption

Extra Thin Core formation process has been designed to minimize the use of air for fluff and SAP convey. The resizing of the suction fan of the forming wheel and the mill redesign

have further contributed to the reduction of energy consumption up to 40% compared to the traditional version.

Space management

Thinner products, lighter shipping expenses

Thanks to Extra Thin Core, diapers are thinner compared to those with a standard core formation, thus reducing the package size: 25% more space available on the shelf and in your stockroom is the result you can achieve!

Spare parts management reducing vehicles' emissions

GDM has created a central warehouse and local stocks to reduce customers' on-site inventory stock value and fixed working capital investment up to 30% per year, while optimizing maintenance planning. The result is twofold: delivery time within 48 hours and polluting gas emissions reduction associated to spare parts logistics.

Turning results into real value is now possible thanks to GDM solutions: their technological developments for the manufacturing of high quality, sustainable products allow you to meet your customers' requirements while reducing waste and cutting production costs at the same time!

Would you like to have more details on how to be more eco-friendly while saving your money? Contact GDM at info@gdm-spa.it



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Performance Pack

Upgrade the performance
of your screening process

by **Stephan Pottier**, R&D Manager, KADANT
and **Alain Lascar**, Technology Director, KADANT



FiberWALL™ basket

Screening is a key step in the paper pulp preparation process. It's main objective is to separate the unwanted components or pollutants from desirable fibres. This separation usually takes place by means of filter elements with holes or slots, and their sizes and designs can vary as per the requirements (coarse, fine screening, etc.). The fibres passing through the openings are called "Accepted" and the larger and less flexible particles that cannot pass through the openings are caught or rejected and usually called "Rejects".



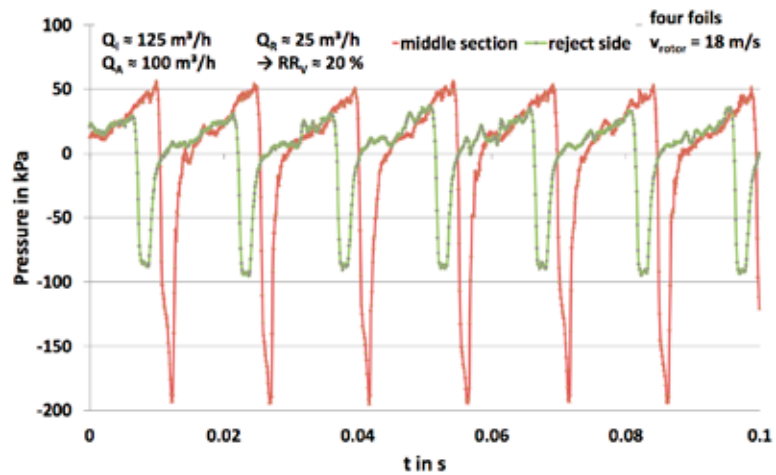
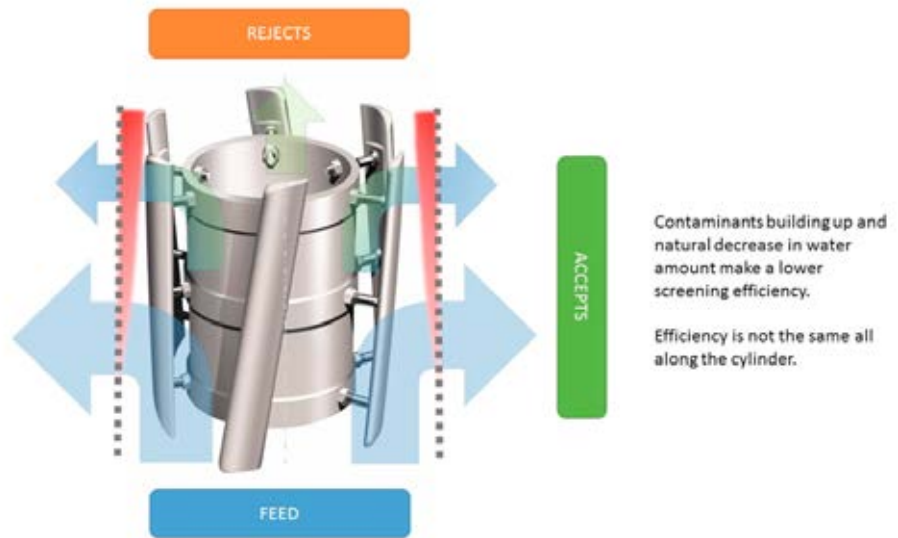
This geometric selection is done physically by the baskets that are one of the key components for the effectiveness of the screening process; and one of the fundamental criteria of performance is the accuracy of the size and design of the openings. KADANT has developed a complete range of baskets with fine holes and slots in order to meet the specific requirements of pulp preparation and approach flow applications, and particularly with the

FibreWALL™ baskets with a robustness and accurate geometry still unmatched (unequaled) today.

The basket is always paired with a rotor equipped with deplugging elements that continuously clean or clear the openings of the basket plugged by particles larger than their sizes. This phenomenon is executed by local and periodic "suctions", which are known as micro pulses.



Diferent types of rotors

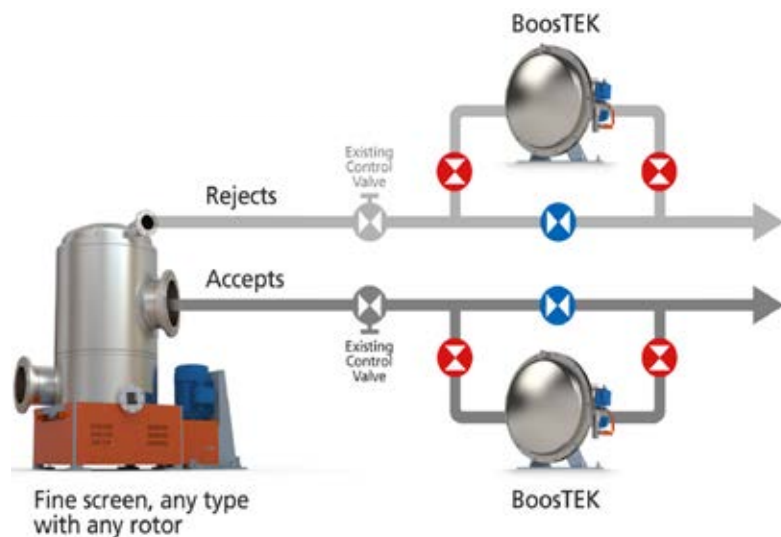


This graph shows the effects of different deplugging depending on whether it is located at the basket's middle section (red curve) or on the reject side (green curve)

The performance of a screen depends on this basket – rotor pair, and is quantified by factors such as total solids rejects rate in weight, or volume, or Fibres reject rate in weight, the contaminants/pollutants removal efficiency, etc., and of course in addition to the paper making process performance, the specific energy required for its accomplishment.

The performance is intrinsically linked to this basket–rotor pair. The physical phenomena therefore depend on each other. For example, the natural thickening along the basket is due to the ability of water to pass more easily through the openings than the fibres and the accumulation of elements larger than the basket size.

KADANT has therefore developed BoostTEK® in order to increase the screening performances. BoostTEK®, is creating macro-pulses of pressure, distantly and independently helps and maximises the positive effects of the rotor on the basket of the screen. BoostTEK® can be easily installed at the accepts and / or rejects of all screens, without any initial impact on the Rotor–Basket pair that is already in place in the machine.



“BoostTEK® is revolutionizing the known principles of screening and expands the operational limits of screens and offers an innovative solution for significant qualitative and quantitative improvements, for optimizing operations of the pressure screens.”

The applications are many and wherever a screen is installed, i.e. for virgin pulp, recycled pulp, plant fibres, non-woven, etc.

BoostTEK® consumes low power, from 0.37 to 2.2 kW, depending on the size. As far as performance is concerned, BoostTEK® increases the capacity (by 10 to 25%), increases cleaning efficiency, and/or reduces fibrous and total losses (by -40 to -65%), (and/or) grants significant potential energy savings (30 to 50%).

BoostTEK® is revolutionizing the known principles of screening and expands the operational limits of screens and offers an innovative solution for significant qualitative and quantitative improvements, for optimizing operations of the pressure screens.”

Some industrial results

BoostTEK® grants significant efficiency savings

Kadant installations with BoostTEK on screen rejects at the last stage have shown a significant reduction in the rejects from the screening process. On an average, recorded an overall increase in efficiency of 0.5 point with reduced fibrous losses of up to 55%.

BoostTEK® helps to save fibres

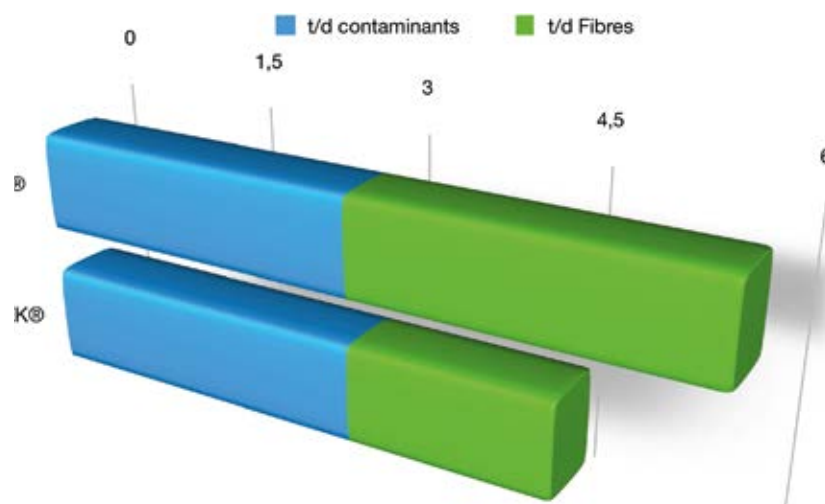
The efficiency gains are obtained by the recovery of fibres, and therefore with high added value. The contaminants are therefore more “pure”. In the graph below, clearly shows a fibre saving.

BoostTEK® increases quality and/or capacity

Kadant experiences with BoostTEK® were able to show an increase in production of up to 25%, and/or a significant increase in quality especially at the level of the flexible contaminants such as stickies, with significant energy savings.

BoostTEK® saves energy

When installed, BoostTEK® reduces the specific energy by another method: by reducing the rotor speed. Owing to its complementary nature with the rotor of the screen, BoostTEK® significantly reduces the rotation speed, while still retaining the same screening process parameters (dense and solid rejects). Reductions of up to 65% were obtained. Moreover, this reduction in speed allows for improved screening efficiency for flexible elements such as Stickies.





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B10-W Red



B10-W Red. The highest performance for the lowest Total Cost of Ownership

B10-W Red is the GDM baby open diaper line with high speed capacity of **1000 ppm**, **efficiency** and **reliability** beyond any expectation. Through the extensive use of Linear Motion and E-cam technologies, it has been designed to deliver high **product quality** while ensuring **process control** and the lowest TCO, according to your needs. Make sure to enhance your production leveraging on our **SB70 Red Series B10** for a full **turn-key solution**.

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*estimated saving, internal calculations

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