GRAPHIC PACKAGING
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Fiber Modification Technology
A new enzyme-based technology to condition unbleached Kraft fibers has proven very successful

Domtar’s Plymouth Mill
Resource Conservation Project Exceeds Expectations
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FEATURES

18 Riding the Wave of Sustainable Paperboard
With the world’s heightened urgency to eliminate plastic and Styrofoam, Graphic Packaging is well positioned to deliver renewable, recyclable, and now compostable, paperboard alternatives.

22 Development of Fiber Modification Technologies for UBK Fibers Using a Novel Analytical Method
The effect of enzymatic treatment to condition fibers prior to refining has been used mostly in bleached and recycled fibers. Although the application of these technologies in unbleached Kraft has been more challenging, a new enzyme-based technology has been developed that has proven to be very effective in unbleached Kraft.

26 Roll Covers from Recyclable and Renewable Raw Materials
Could roll covers be made of recycled or even bio-based materials? With less than two years’ intensive R&D work, Valmet has taken a remarkable step toward a more sustainable era in the field of production consumables in papermaking.

COLUMNS

14 Health & Safety Matters
The challenges of COVID-19 show us how critical our industry and supply chain both are.

DEPARTMENTS

4 Editor’s Note

6 Industry News

12 People

16 Environmental Spotlight – Domtar’s Plymouth Mill
Just one year after the installation of a cooling tower and new heat exchangers, the mill’s closed-loop system for heating process water has exceeded expectations by dramatically reducing daily water consumption and fuel costs.

28 Of Interest
Metsä Fibre’s Furnish Improvement Tool (FIT), which was originally developed for the analysis of pulp grades, now has simulation capabilities for paper, board, and in the not too distant future, tissue.

SERVICES

29 Classified Ads

29 Index of Advertisers
I still can’t get used to going to the grocery store or our local Walmart and seeing empty shelves where paper towels and toilet paper used to always be well stocked. Same goes for cleaners and disinfectants like Clorox Cleanup and Lysol. It’s mid-May, and although availability has improved, it’s nowhere near what it used to be.

At the start of the outbreak, the run on toilet paper was a mystery to me — and a little scary to say the least. It really didn’t make any sense until one of my friends shed light on the situation and pointed out that all of the toilet paper sold in the U.S. was made in China, and all the toilet paper factories over there were shut down (at the time), and soon there wouldn’t be a roll of TP anywhere.

Ahhhhh, now it all made sense.

As much as I would have liked to ask the Governor of Massachusetts, Charlie Baker, if I could have a couple of minutes during one of his daily televised coronavirus briefings to set the record straight about where, exactly, the majority of tissue products sold in the U.S. are produced, I instead did the next best thing. I jumped on my LinkedIn page and reposted news that the U.S. Department of Homeland Security considers forest products as an ‘essential industry’ that should remain operational during this pandemic, and that, of course, included the tissue makers, who by the way are located in the U.S.

The story was from our website and included assurances from tissue producers around the country that there would be plenty of our suddenly precious tissue products.

Georgia-Pacific (Angel Soft and Quilted Northern): “We’re quickly responding by expediting product that optimizes our existing inventory, increasing production, and utilizing a managed distribution process to smartly manage through this unusual period. Our tissue manufacturing facilities are operating 24/7 and our employees are doing all they can to serve our customers and meet consumers’ needs during this situation.”

Kimberly-Clark (Kleenex, Cottonelle): “We want to assure consumers that we are doing our best to ensure a steady supply of product to stores, and Kimberly-Clark is working closely with our retail partners and customers to understand their current needs. We have plans in place to address the increased demand for our products to the extent possible, including accelerating production and reallocating inventory to help meet these needs.”

Procter & Gamble (Bounty, Charmin, Puffs): “During times like this, people count on the benefits and availability of our products . . . Please know that we’re working diligently to meet increased demand in this highly dynamic situation.”

Clearwater Paper (private brands): “Clearwater Paper is also experiencing a significant increase in demand for its retail tissue products and an increase in demand for paperboard used for packaging food and pharmaceutical products. The company is focused on ensuring continuous operations to serve its customers’ demand for these essential goods.”

Marcal (Marcal and Bella): “While Covid-19 may have slowed many, it has ramped up our production and spirit of giving back to our community! Thanks to our tireless staff for staying strong and working healthy during these unprecedented times.”

As hard as this may be to believe, my LinkedIn post and my 38 followers were unable to convince the 330 million or so people across the U.S. to stop hoarding toilet paper and the chances of finding a case for myself would be slim.

In all seriousness, I, and I’m sure millions of consumers, would like to thank all the men and women in pulp, paper and converting plants for going to work every day to make sure we all have our fair share of much-needed tissue and paper products.

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NORTH AMERICA

Domtar Temporarily Idles Papermaking Operations at Hawesville Mill

Domtar on May 5 began the planned curtailment of the papermaking operations of its Hawesville, Kentucky, mill. Domtar said the measure is designed to temporarily right-size production capacity in light of the business conditions created by the COVID-19 pandemic.

The company expects to restart the H1 paper machine in June 2020, while the H2 paper machine will remain idled until July 2020.

The temporary shutdown will reduce Domtar’s uncoated freesheet paper production capacity by approximately 83,000 short tons.

About 400 employees were laid off as a result of the shutdown.

This incremental action follows Domtar’s idling of its Kingsport, Tennessee, mill and the A62 paper machine at its Ashdown, Arkansas mill. Combined, the temporary shutdowns will reduce production capacity by approximately 227,000 short tons of uncoated freesheet paper. The company anticipates inventory to be at appropriate levels after this downtime.

“Throughout the COVID-19 pandemic, we have been actively monitoring the impacts to our business and taking methodical steps to optimize capacity in the current environment,” said John D. Williams, President and CEO of Domtar. “We believe it is appropriate to take the additional step of temporarily idling our Hawesville mill in light of reduced paper demand. We are optimistic that we have taken the right actions to effectively manage the business through these evolving market conditions.”

The Hawesville pulp and paper mill has the capacity to produce 596,000 short tons of uncoated freesheet (UFS) per year with two paper machines. The mill also has a fiber line with a production capacity of 412,000 air dry metric tonnes per year of Southern Bleached Hardwood (SBHK) pulp.

Pixelle Restarts Two Paper Machines at Androscoggin Mill after Digester Explosion

Pixelle Specialty Solutions on April 23 restarted two of the paper machines at its Androscoggin mill in Jay, Maine, a week after an explosion of the mill’s digester.

Pulp and papermaking operations at the mill came to a halt on April 15 after a rupture of the mill’s digester caused a massive explosion. There were no workers in the immediate area of the digester and no serious injuries were reported.

According to information collected by the State Fire Marshal’s Office with assistance from Jay police, mill employees manually shut down valves following the explosion, which helped prevent further damage.

Pixelle said the A4 and A5 machines are running 24x7 and customer service and sales personnel are taking orders from customers.

The mill is utilizing pulp produced by Pixelle mills in Chillicothe, Ohio and Spring Grove, Pennsylvania, and supplemental purchased pulp. The Jay, Maine mill’s onsite pulping equipment has capacity to process all incoming pulp. Recent investments in refining equipment will enable the paper machines to produce at the normal quality and output levels, Pixelle said.

Commenting on the restart, Tim Hess, Pixelle’s President and CEO, said, “Our team in Androscoggin has performed exceptionally well. First and foremost, we will always remember that immediately following the rupture, they utilized their training, skill, and bravery to safely shut down operations. Likewise, we will always be grateful there were no injuries, and no environmental impact.”

Pixelle said that it will continue assessment, root cause analysis, clean-up of the affected site as soon as conditions allow, and evaluation of potential options for future long-term pulp production. Clean-up and evaluation will require extended time, during which the third paper machine, which produced non-specialty grades, will not be operated.

The Androscoggin mill has the capacity to produce approximately 425,000 tons of paper per year and currently produces flexible packaging papers, release liner base, specialty labels, kraft papers and linerboard.
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Greif on April 1 completed its previously announced sale of the Consumer Packaging Group ("CPG") business for $85 million in cash to Graphic Packaging Holding Company.

"Given our industrial focus, we were not the rightful owner of the CPG business. The sale helps us de-lever our balance sheet, optimize our capital allocation plans and refocuses our business on our core industrial franchise and strategic growth priorities in Intermediate Bulk Container production and reconditioning and containerboard integration," said Pete Watson, Greif’s President and CEO.

Mike Doss, President and CEO of Graphic Packaging said, “We are excited to announce the acquisition of the Consumer Packaging Group business from Greif, Inc. The transaction further diversifies our end-markets and enhances our service capabilities to growing mid-sized consumer goods and food service customers.”

Graphic Packaging noted that the deal includes seven converting facilities across the U.S. that produce over $200 million in annual revenue. The business is expected to generate approximately $20 million in annualized EBITDA, including synergies, over the 24-month period after the successful completion of the acquisition.

Sonoco has approved an $83 million investment to strengthen its uncoated recycled paperboard (URB) mill system in the United States and Canada. The majority of the investment includes transforming its Hartsville, South Carolina corrugated medium machine (No. 10 machine) into a URB machine with annual production capacity of approximately 180,000 tons.

The new Hartsville machine will be designed with the capability of producing a wide range of high-value paper grades to service Sonoco’s industrial and consumer converted products businesses and external trade customers.

Sonoco is a leading producer of URB, with 12 mills and 20 machines in the U.S. and Canada. As a result of the Hartsville No. 10 machine conversion, Sonoco will be exiting the corrugated medium market by the end of 2021, and the expected efficiency of the converted machine will give the company the opportunity to rationalize some of the higher cost assets in its mill system.

“We are calling this investment ‘Project Horizon’, as we will be creating a much brighter future for our domestic URB mill system while resolving the volatility we have experienced as an independent producer of corrugated medium from our No. 10 machine,” said Howard Coker, President and CEO of Sonoco.

The Hartsville No. 10 machine conversion will start with the development of a new recycled fiber stock prep system, which will allow the Hartsville paper mill complex to use a wide range of low-cost mixed paper and old corrugated containers.

Design work and stock prep development will begin in the second half of 2020, and the machine conversion should be completed and on-line by early 2022.

As part of the mill system optimization program, Sonoco will also increase capacity of its Wisconsin Rapids, Wisconsin, mill.

In a related announcement, Sonoco is permanently closing its No. 3 URB paper machine in Hartsville and its Trent Valley, Ontario, Canada paper mill due to market conditions.

International Paper on March 29 announced that it has entered into an agreement to sell its Brazilian corrugated packaging business to Klabin S.A. for R$330 million, with R$280 million to be paid at closing and R$50 million one year thereafter, subject to certain adjustments. This business includes three containerboard mills and four box plants.

This agreement follows International Paper’s previously announced strategic review of the Brazil packaging business.

The transaction is expected to close in the second half of 2020, subject to certain closing conditions and regulatory approvals.

International Paper will continue to run its Papers and Forestry businesses in Brazil.

International Paper to Sell its Corrugated Packaging Business to Klabin for R$330 Million

Greif Completes Sale of Its Consumer Packaging Group to Graphic Packaging

NORTH AMERICA
Pennsylvania-based American Eagle Paper Mills in May launched a new line of antimicrobial paper to help minimize the transmission of communicable diseases. The Eagle Armour® suite of paper products are treated with Biomaster® silver ion technology to provide antimicrobial protection for the lifetime of the paper.

“To address the need for cleaner surfaces, American Eagle Paper Mills is proud to have successfully manufactured a paper that incorporates an antimicrobial agent,” said Scott Igoe, President of American Eagle Paper Mills. “What’s especially great about Eagle Armour antimicrobial paper is that it inhibits the growth of bacteria without sacrificing paper performance or appearance.”

Laboratory testing conducted by the Rochester Institute of Technology (RIT) showed no noticeable difference in print quality between the antimicrobial treated paper versus the untreated control paper.

According to Biomaster USA, supplier of the EPA registered antimicrobial silver technology used in the Eagle Armour branded papers, silver is an element found naturally in the environment and has long been regarded as a versatile antimicrobial agent. The silver ions interact with the molecular processes within microorganisms resulting in inhibition of growth, loss of energy production, and prevention of DNA replication and new cell formation.

“Additional testing performed at an independent microbiology laboratory on the antimicrobial-treated paper demonstrated a 99.9% reduction in non-pathogenic bacteria,” Igoe explained. “These papers are ideal for use in hospitals, clinics, doctor offices, dental offices, long term care and assisted living facilities, restaurant and food service facilities, schools, offices, and more.”

Case Paper announced that it has acquired the assets of the former API Laminating operation of Steel Partners in Osgood, Indiana.

According to Case Paper, Jonathan Hummer, the General Manager of the facility, as well as most of the office and plant employees have joined the Case family under the new name “Case Makes.”

“This is a true testament to the employees and processes they currently have in place, and the reason why this is a perfect fit for Case Paper and our long term vision to consistently add value to customers through inventories, converting equipment, locations, and people.

“Additionally, it allows us to vertically integrate, control our supply chain and improve our response time.”

Simon Schaffer, Chief Marketing Officer at Case Paper, added, “Laminating, coating, and transfer metallization are just a few of the converting capabilities we have strategically envisioned for adding innovation to the future of Case Paper.”

Canfor Pulp Products announced the curtailment of Prince George Pulp and Paper and Intercontinental Pulp for approximately four weeks starting July 6, 2020.

Both mills are located in Prince George, British Columbia, Canada.

“We have made the difficult decision to temporarily curtail Prince George Pulp and Paper and Intercontinental Pulp due to the major global economic impacts of the COVID-19 pandemic and the shortage of economically viable fibre in the region,” said Canfor Pulp’s Chief Executive Officer Don Kayne.

The curtailment will reduce Canfor Pulp’s production output by approximately 38,000 tonnes of market kraft pulp and 12,000 tonnes of kraft paper.

Canfor Pulp has three Northern Bleached Softwood Kraft (NBSK) pulp mills, one Bleached Chemi-Thermo Mechanical Pulp (BCTMP) mill, and one kraft paper mill in BC.
NORTH AMERICA

Seaman Paper Introduces High-Touch Barrier Tissue

Seaman Paper has introduced a new paper-based solution designed to help minimize direct hand contact with high-contact common surfaces. High-Touch Barrier Tissue is an FDA-compliant paper, packaged with either 500 or 1,000 “grab-and-go” sheets, which can serve as a barrier between hands and high-contact surfaces.

Jamie Jones, an owner of Massachusetts-based Seaman Paper, said, “In this time of heightened concern over the spread of viruses, we are happy to be able to bring an innovative solution that can help keep everyone healthy and safe.”

Available in two sizes (6”x10.75” and 8”x10.75”), High-Touch Barrier Tissue can be dispensed to customers at the gas pump, in the grocery/convenience store, or wherever many hands touch the same surface.

“With protective gloves in high demand, our barrier tissue creates a paper-based alternative that has less of an environmental impact while also helping to ensure that our medical professionals and other emergency workers retain access to crucial glove supplies,” Jones added.

EUROPE

Metsä Tissue Files Environmental Permit Application for Mariestad Mill Expansion

Metsä Tissue in May filed an environmental permit application with the Land and Environment Court in Vänersborg, Sweden, for its plans to increase tissue production at its Mariestad mill in Sweden.

The investments planned to be implemented at the first stage would increase the annual tissue paper production capacity at Mariestad from 70,000 tonnes to 140,000 tonnes, starting fully in 2024.

The estimated value of the potential investments is roughly EUR 230 million.

Metsä Tissue expects the Land and Environment Court render its decision on the matter within 12-18 months. Obtaining an environmental permit is one of the prerequisites for the final investment decision.

The plans and the scope of the project may change as a result of an ongoing feasibility study, Metsä Tissue said.

Metsä Fibre Begins Second-Phase of Bioproduct Mill Project in Finland

Metsä Fibre has completed the first phase prep work as part of the pre-engineering of its planned Kemi bioproduct mill in the existing Kemi mill (Finland) area, and in April started the second phase of the EUR 1.5 billion project.

The second-phase prep work, which is expected to be finished in November, includes emptying the buildings in the future mill area in Pajusaaari and relocating operations, after which the buildings will be demolished.

As a whole, the pre-engineering of the bioproduct mill is progressing as planned, Metsä Fibre said.

The financing negotiations concerning the investment of around EUR 1.5 billion have also progressed. In March 2020, Finnvera provided a guarantee for EUR 500 million in credit with an 80% coverage, provided that Metsä Group invests in the new mill. Financing negotiations with the European Investment Bank and a number of commercial banks continue.

According to Metsä Fibre, the new mill would operate entirely without fossil fuels and produce 1.5 million tonnes of softwood and birch pulp and many other bioproducts annually. The mill would use 7.6 million cubic metres of wood per year, representing an increase of 4.5 million cubic metres compared with the current pulp mill.
EUROPE

Hamburger Containerboard Nearing Start-up of New Containerboard Machine

Hamburger Containerboard said that it has rescheduled the start-up of its new containerboard machine, PM2, at its mill in Spremberg, Germany, for the first week of September. PM 2 was originally scheduled to start-up this summer, but the decision to push the timeline back was made following impacts from the COVID-19 pandemic as well as a recent fire on the building site.

PM 2 Project

In March of 2018, Hamburger Containerboard started construction of the Spremberg mill’s second paper machine, PM2. The EUR 370 million project includes the new machine, which has a width of 7.80 metres and the capacity to produce 500,000 tonnes per year of white and brown corrugated base papers (testliner) based on 100% recycled paper.

Deinking equipment is also included in the project.

The paper mill at the Spremberg site is part of the Hamburger Containerboard division of the Austrian Prinzhorn Group. The division produces white coated and uncoated testliner under brands such as RiegerLiner, RiegerTop and SpreeWhite.

AUSTRALIA / NEW ZEALAND

Nippon Paper Industries Acquires Orora’s Paperboard and Converting Business

Nippon Paper Industries and its wholly owned subsidiary, Paper Australia Pty Ltd, completed the purchase of Orora Limited’s paperboard and fibre based packaging business in Australia/New Zealand.

Nippon Paper first announced the deal in October of 2019. At that time, the enterprise value of the acquisition was AUD 1.72 billion in cash, subject to adjustment for movements in working capital and debt items.

“Orora has established strong operations in Australia and New Zealand through a comprehensive business model combining a wastepaper collecting system with cutting-edge corrugated base paper manufacturing, highly automated cardboard production and the provision of packaging-related materials and associated services,” Nippon Paper said.

“Through the acquisition of the Business, Nippon Paper Group will be entering the integrated corrugated paperboard manufacturing business in the Oceania region. Nippon Paper seeks not only to augment the synergistic effects with [Paper Australia], but also plans to further build the Group’s packaging business on a global scale,” the company added.

Together with Australian Paper’s existing business, the acquired assets and business has been incorporated into new wholly owned subsidiaries of Australian Paper, together known as ‘Opal’, a vertically integrated paper and packaging solution business.

The Opal business includes the collection of wastepaper under its own system, manufacturing packaging board with modern facilities, converting board into packaging boxes through highly automated production, and supplying ancillary materials and associated services.

CHINA

IT Tech Packaging to Install Tissue Production Line in North China

IT Tech Packaging announced plans for the commercial launch of a new tissue paper production line, PM10, in North China. In April the company signed a purchase agreement with a machine supplier for the delivery of PM10.

No further details were provided about the machine’s capacity or a start-up date.

“As the tissue paper market represents significant opportunities for us with its strong growth prospects, especially outbreak of COVID-19 stimulates consumption surge of life necessaries such as tissue paper, we plan to launch the third tissue paper production line in addition to the existing PM8 and PM9,” said Zhenyong Liu, Chairman and CEO of ITTech Packaging.

IT Tech Packaging expects to launch commercial production of the PM10 following successful trial runs.
**PAPER**

- **American Eagle Paper Mills** has named **Scott Igoe** as President. He succeeds board member **Philip Devorris**, who took over as Interim President in December 2018 and will remain in his role on the mill’s Board. A chemical engineer, Igoe joined the mill in 1987 as an Operations Engineer under Westvaco ownership. He gained broader experience over four years in technical and managerial positions at mills in Maine and Virginia, before returning as an equity partner in 2003 to help reopen the American Eagle paper mill in Tyrone, Pennsylvania.

- **Clearwater Paper** has appointed **Michael J. Murphy** as Senior Vice President and Chief Financial Officer. Murphy succeeds **Robert G. Hrivnak**, who left the company. Murphy joins Clearwater from NxEdu, where he served as CFO. Prior to NxEdu, he held senior finance, risk management, and strategy positions with Kapstone Paper and Packaging and Boise, Inc.

- **Neenah, Inc** announced that Senior Vice President, Chief Financial Officer and Treasurer **Bonnie Lind** plans to retire. Ms. Lind will remain with Neenah through an October 1 retirement date to ensure a smooth transition. In addition, Neenah has appointed **Paul DeSantis** as Senior Vice President, Chief Financial Officer, and Treasurer, effective May 13, 2020. DeSantis most recently served as CFO at OMNOVA Solutions.

- **Twin Rivers Paper Company** President and CEO **Bob Snyder** has retired and **Tim Lowe** has been appointed to assume Snyder’s role in an interim capacity until a successor to Snyder is found. Lowe served as CEO of Twin Rivers from 2013 - 2016.

- **Stora Enso** has appointed **Katariina Kravi** as EVP, Head of Human Resources and a member of the Group Leadership Team, effective Sept. 1. Ms. Kravi most recently served as Chief People and Culture Officer at Tieto Oyj, a leading Nordic software and services company. Ms. Kravi holds a Master’s degree in law.

- **Verso Corporation** has appointed **Matthew M. Archambeau** as Senior Vice President, Manufacturing and Energy. Archambeau’s previous leadership experience at Verso includes Vice President of the Centers of Excellence/Technology; Mill Manager at Verso’s Escanaba, Michigan, mill and former Bucksport, Maine, and Sartell, Minnesota, mills; Director of Manufacturing Support, Memphis, Tennessee. Archambeau holds a bachelor’s degree in Chemical Engineering from the University of Minnesota – Duluth.

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**INDUSTRY ASSOCIATIONS**

- **Kadant Johnson** announced the expansion of its Operations group and appointed **Alan Ives** as Vice President, Operations and **Harry Brown** as Director of Manufacturing. Ives served as the Director of Engineering and held various technical roles since joining the company in 1993. Brown formerly served as Manufacturing Superintendent at Kadant Johnson and prior to that worked in various capacities in manufacturing since joining the company in 1980.

- **Motion Industries** has promoted **Greg Cook** to Executive Vice President and Chief Financial Officer of Motion Industries. Cook joined Motion Industries as Senior Vice President and CFO in November 2016 and has over 29 years of experience in the manufacturing and distribution markets.

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**ASSOCIATIONS**

- **The Fibre Box Association** has elected **Cathy Foley** as the Association’s 2020 - 2021 chairman. Ms. Foley is Vice President Industry Relations and Supply Chain at Pratt Industries.
INDUSTRY SUPPLIERS


Valmet will supply a fine papermaking line with stock preparation, an extensive scope of automation and a recovery boiler for Sun Paper in Beihai, China. In addition, another stock preparation line for a different Sun Paper site will be supplied.

The new 11,150-mm-wide fine paper machine is designed to produce 500,000 tonnes per year of high-quality woodfree uncoated paper (WFU) grades in the basis weight range of 50-100 g/m². The design speed of the machine is 1,800 m/min.

Valmet’s delivery also includes a new high-power recovery boiler with a capacity of 4,600 tDS/d (tonnes dry solids a day).

Valmet’s delivery is part of Sun Paper’s new greenfield mill in Beihai, which will eventually have a total pulp and paper capacity of 3.5 million tonnes annually. The mill will be constructed in two phases over approximately five years.

Valmet’s delivery includes a complete fine paper making line (PM 1) from stock preparation to parent roll handling and two winders with related air, chemical and process systems, an extensive automation package, and start-up packages for spare parts, consumables and paper machine clothing.

The stock preparation delivery for PM 1 includes stock lines for softwood, hardwood and BCTMP (bleached chemi-thermo-chemical pulp), broke collection, stock mixing and an approach flow system.

Start-ups of the paper making line and the recovery boiler are scheduled for 2021.

About Sun Paper

Sun Paper is one of the subsidiaries of Shandong Sun Holdings Group. Currently Sun Paper has two mills in China’s Shandong province with around 4 million tonnes/year of paper and board capacity and 1.3 million tonnes/year of wood pulp capacity. The company also operates a mill in Laos with a 300,000 tonnes/year dissolving pulp line and a 400,000 tonnes/year recycled pulp line. In July 2019, Sun Paper established a wholly owned subsidiary, Guangxi Sun Paper, to build an integrated pulp and paper mill in Beihai.
The challenges of COVID-19 show us how critical our industry and supply chain both are.

By Heidi Brock, President and CEO, American Forest & Paper Association

“We’re all in this together.” That’s a phrase I’ve heard many people say repeatedly these past few days and weeks, and it’s a message that, at this very moment, exemplifies the collective spirit of the pulp, paper, packaging, tissue and wood products industry.

In so many ways, our industry is rising to the occasion — a moment in history that the United Nations Secretary-General António Guterres recently called the “most challenging crisis we have faced since the Second World War.”

The COVID-19 pandemic threatens people in every country around the world, and it has brought many aspects of life to a grinding halt, but it hasn’t stopped the resolve of our industry.

The challenges of COVID-19 show us how critical our industry and supply chain both are, as we continue to do our part. Members of the American Forest & Paper Association (AF&PA) make essential products, including tissue products, pulp used in diapers and other personal hygiene products, papers for communication and education, building and construction products, and packaging for food, beverages, foodservice, cleaning supplies, pharmaceuticals, medical equipment and other essential consumer products.

Most importantly, our industry is steadfast in its commitment to worker health and safety. It’s been the primary focus for AF&PA long before this crisis emerged, and it’s helping guide us forward at a moment when health and safety is the responsibility of everyone if we are to flatten the COVID-19 curve.

At the same time, I feel heartened to hear stories from our product manufacturers and individual employees, who are working safely to maintain essential products, while also finding ways to support the well-being of others.

AF&PA member companies are finding ways to support the well-being of others. So far, this work includes in-kind donations to local communities, including face masks for hospitals and containerboard boxes, so that food banks can transport nutritional items, as well as charitable contributions to NGOs and other nonprofits. I strongly believe these acts of generosity — supporting one another and supporting our communities — matters now, more than ever.

At AF&PA, we are staying focused on worker safety and advocacy that stresses the essential nature of our industry. At the federal level, we engaged the White House and Department of Homeland Security as they developed and updated the Cybersecurity and Infrastructure Security Agency Guidance, which includes issued guidance and clarity for the forest products industry supply chain so that manufacturing and production of the essential products we make can continue in a reliable and safe manner.

Working with industry allies, we also successfully included language in the
Senate version of the Coronavirus Aid, Relief, and Economic Security (CARES) Act to clarify that states can issue special permits for overweight vehicles and loads to allow for the free flow of critical relief supplies during the coronavirus pandemic for the duration of the fiscal year. This language grants states greater flexibility to allow heavier trucks on interstate highways and increases the efficiency of the industry’s supply chain.

And we continue to monitor and respond to states and local jurisdictions that are issuing “shelter-in-place” and “stay-at-home” orders, reinforcing the essential nature of our work. Through this crisis, we remain committed to protecting our license to operate, including policy work with the Environmental Protection Agency.

This is an unprecedented time, and I am humbled by everyone’s ability to so naturally rally at this important moment in history with the same collective spirit. Because “we’re all in this together.”

Finally, let me reiterate our industry’s commitment to worker safety started long before the COVID-19 pandemic. Now is a time where that commitment and training can make an important contribution within our local communities. Now is a time where that experience can make an important difference to our families, friends and co-workers.

Let’s use that experience to find ways to make a difference in these days, weeks, and months ahead. Let’s use that experience to find our way safely to the other side of this crisis. Together, I know we will.

About AF&PA
The American Forest & Paper Association (AF&PA) serves to advance a sustainable U.S. pulp, paper, packaging, tissue and wood products manufacturing industry through fact-based public policy and marketplace advocacy. AF&PA member companies make products essential for everyday life from renewable and recyclable resources and are committed to continuous improvement through the industry’s sustainability initiative — Better Practices, Better Planet 2020.

The forest products industry accounts for approximately four percent of the total U.S. manufacturing GDP, manufactures approximately $300 billion in products annually, and employs nearly 950,000 men and women. The industry meets a payroll of approximately $55 billion annually and is among the top 10 manufacturing sector employers in 45 states. For further information, visit AF&PA online at www.afandpa.org.

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Domtar’s Plymouth Mill
Resource Conservation Project Exceeds Expectations

Domtar’s Plymouth mill is located in Plymouth, North Carolina, and has the capacity to produce 390,000 ADMT (air dry metric tonnes) per year of softwood fluff pulp known for its excellent absorbency and sheet properties. The pulp is used in the production of adult incontinence products, baby diapers and absorbent hygiene products.

Last year, the mill improved its hog fuel boiler so it can produce more steam while burning less biomass (typically bark), which is particularly important because the mill has to purchase biomass from a third party to supplement its own biomass so it has enough hog fuel to produce the steam needed to power mill processes. After the project, the boiler is producing 15 percent more steam per ton of biomass.

**Lower Daily Water Consumption**

The Plymouth Mill has taken another step toward a more sustainable future thanks to the success of a recent resource conservation project. Just one year after the installation of a cooling tower and new heat exchangers, the mill’s closed-loop system for heating process water has exceeded expectations by dramatically reducing daily water consumption and fuel costs.

Last May, the team installed a cooling tower and two large heat exchangers to reclaim waste heat from the mill and use it to reduce steam consumption. While the resource conservation project was originally expected to eliminate the use of about 11 million gallons of river water per day, Operations Manager David Council says the system is performing better than expected, saving approximately 18 million gallons of water per day.

While the resource conservation project was originally expected to eliminate the use of about 11 million gallons of river water per day, the system is performing better than expected, saving approximately 18 million gallons of water per day.
Before the team installed the new equipment, the mill used water from the nearby Roanoke River to cool mill processes. The mill returned the water to the river in the same condition, only slightly warmer.

With the addition of the cooling tower and heat exchangers, the mill now has a closed-loop system that reclaims heat from the mill’s evaporation equipment and transfers it to process water. The reclaimed heat reduces the mill’s steam load, which means it burns less fuel in the boilers to make steam.

“Our water use reductions are exceeding our expectations thanks to the new cooling tower and heat exchangers,” Council says of the resource conservation project. “We are more than achieving our goal, and our water use is now among the lowest of Domtar’s mills.”

**More Efficient Heating**

Council says the resource conservation project is also exceeding the mill’s expectations with regard to heating process water. Before installing the new heat exchangers, the team expected the system to heat water to 85 degrees Fahrenheit. Instead, Council says the heat exchangers are warming it to 97 degrees, and they are confident they can reach 100 degrees soon.

Why is this so important? Many processes across the mill operate at temperatures at or above 140 degrees. Before the new closed-loop system was operating, the mill burned fuels like biomass or natural gas to make steam that was used to heat the river water to process temperatures. The colder the river water, the more fuel required to reach process temperatures.

“In the winter, the river water can be as cold as 45 degrees,” Council says. “It takes a lot of heat to bring it up to temperature. Today, the heat exchangers use waste heat from the mill to achieve a portion of this heating requirement, reducing the need for inefficient and costly heat sources.”

**A More Sustainable Future**

Plymouth Mill Manager Everick Spence says the resource conservation project is creating efficiencies that will ensure the Plymouth Mill has a strong and sustainable future.

“This resource conservation project has played an important role in helping achieve our strategic vision of becoming a highly efficient mill,” he says. “I look forward to continuing to realize and build on these benefits to ensure our mill continues to be a great place to work for many years to come.”

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Riding the Wave of Sustainable Paperboard

With the world’s heightened urgency to eliminate plastic and Styrofoam, Graphic Packaging is well positioned to deliver renewable, recyclable, and now compostable, paperboard alternatives.

By John O’Brien, Managing Editor

With 9 mills and 68 converting facilities worldwide, Graphic Packaging International (GPI) is the largest, integrated paperboard packaging provider in the world. The company is #1 (market share) in CRB (coated recycled board) and CUK (coated unbleached kraft) paperboard, and #2 (market share) in SBS (solid bleached sulfate) paperboard in the U.S.

In 2019, approximately 68% of combined mill sales of CRB, CUK and SBS was consumed internally. In the first quarter of 2020, GPI’s vertical integration rate increased to 69%.

The company’s customers include many of the world’s most widely recognized companies and brands with prominent market positions in beverage, food, foodservice and other consumer products.

Graphic Packaging’s three reportable segments include:

**Paperboard Mills** – include nine North American paperboard mills that produce primarily CRB, CUK, and SBS, which Graphic Packaging primarily consumes internally to produce paperboard packaging for the Americas and Europe Paperboard Packaging segments. The remaining paperboard is sold externally to a wide variety of paperboard packaging converters and brokers.

**Americas Paperboard Packaging** – includes paperboard packaging, primarily folding cartons, sold primarily to Consumer Packaged Goods (CPG) companies, and cups, lids and food containers sold primarily to foodservice companies and quick-service restaurants — all serving the food, beverage, and consumer product markets in the Americas.
Europe Paperboard Packaging – includes paperboard packaging, primarily folding cartons, sold primarily to CPG companies serving the food, beverage and consumer product markets in Europe.

**GPI’s Primary Grades**

**CRB.** Graphic Packaging is the largest North American producer of CRB. CRB is manufactured entirely from recycled fibers, primarily old corrugated containers (OCC), doubled-lined kraft cuttings from corrugated box plants (DLK), old newspapers (ONP), and box cuttings. The CRB is clay-coated to provide an excellent printing surface for high quality graphics and appearance characteristics.

In 2019, GPI produced 999,224 short tons of CRB.1

**CUK.** The company is the largest of four worldwide producers of CUK. CUK is manufactured from pine-based wood fiber and is a specialized high-quality grade of coated paperboard with excellent wet and dry tear strength characteristics and printability for high resolution graphics.

In 2019, GPI produced 1,619,255 short tons of CUK.1

**SBS.** Graphic Packaging is one of the largest North American producers of SBS, which is manufactured from bleached pine and hardwood-based wood fiber and is the highest quality paperboard substrate with excellent wet and dry strength characteristics and superior printability for high-end packaging. The SBS board is clay-coated to provide an excellent printing surface and can also be coated with polyethylene resin for wet strength liquid and food packaging end uses.

In 2019, GPI produced 1,190,477 short tons of SBS.1

**Corrugated Medium.** The company also manufactures corrugated medium for internal use and sale in the open market. In 2019, GPI produced 121,929 short tons of corrugated medium.

**Fiber Mix**

According to Graphic Packaging’s 2019 annual report, the company utilizes a combination of pine and hardwood trees, and recycled fibers (including DLK, OCC and ONP).

For its mills in West Monroe, Louisiana; Macon, Georgia; Texarkana, Texas; and Augusta, Georgia, fiber such as pine and hardwood pulp and recycled fiber comes from private landowners and the open market, along with a supplement of clippings from its converting operations.

Paperboard grades produced at mills in Kalamazoo, Michigan; Battle Creek, Michigan; Middletown, Ohio, East Angus, Quebec and White Pigeon, Michigan, are made from 100% recycled fiber, which GPI procures from external suppliers and internal converting operations.

**New CRB Machine for Kalamazoo**

In August of 2019, Graphic Packaging announced a $600 million investment in a new CRB machine in the Midwest with an annual capacity of approximately 500,000 tons. Just over a month later, the company named its Kalamazoo, Michigan mill as the location for the new machine.

According to Graphic Packaging, the new CRB machine is designed to be the largest and lowest cost producer of CRB in North America.

“We are very pleased to announce our intent to proceed with this significant investment into our integrated CRB platform. This is a unique opportunity to make a highly strategic investment in sustainable packaging, exceptional product quality and an unmatched cost position for producing CRB,” said President and CEO Mike Doss at the time of the announcement.

“Importantly, the investment will be capacity neutral as we expect to reduce production at other higher cost CRB facilities after we ramp up production of this highly productive CRB machine starting in early 2022,” he added.

In 2019, the Kalamazoo mill produced about 493,000 short tons of CRB on two machines.
The acquisition of Greif’s Consumer Packaging Group business included seven converting facilities across the U.S. that manufacture folding cartons for consumer packaged goods businesses. The converting plants consume about 125,000 tons of paperboard (predominately CRB) annually.

A Growing Integrated Mill and Converting Platform

At the end of January 2020, Graphic Packaging acquired a folding carton facility in Omaha, Nebraska, from Quad/Graphics for $40 million. The approximately 400,000 square foot converting facility, which consumes about 40,000 tons of paperboard (predominately CRB) annually, is strategically located close to many of GPI’s existing food, beverage and industrial customers. The business generates approximately $75 million in revenue.

Most recently, on April 1, Graphic Packaging closed the acquisition of Greif’s Consumer Packaging Group business for approximately $85 million. The deal included seven converting facilities across the U.S. that manufacture folding cartons for consumer packaged goods businesses. The converting plants consume about 125,000 tons of paperboard (predominately CRB) annually.

The acquisition is designed to enhance GPI’s service capabilities to small-to-medium sized customers, while providing the opportunity for structural fixed cost reduction in converting plant footprint over time.

Mike Doss said, “We are excited to announce the acquisition of the Consumer Packaging Group business from Greif, Inc. The transaction further diversifies our end-markets and enhances our service capabilities to growing mid-sized consumer goods and food service customers.

“The continued strategic investments we are making in our integrated mill and converting platform reflect our commitment to existing and new customers to provide the industry’s most efficient production of the highest quality paperboard into sustainable packaging solutions,” he added.

Customers Seeking Paperboard Alternatives to Plastic

In GPI’s latest sustainability report, Bill Sedlacek, VP, Innovation & New Business Development, was asked about themes that have emerged in recent years with respect to evolving customer and consumer needs.

“Awareness of sustainability challenges and their environmental effects has been evolving in recent years and seems to have reached an inflection point over the past year. Where environmental responsibility previously may have been a consideration for our customers, it is now a requirement,” Sedlacek emphasized. “Consumers are more often making conscious decisions to change their consumption patterns with increased focus on product and material choices. Demographic shifts, including the purchasing power and influence of millennials, are amplifying the message and expediting the demand. Front and center is the heightened urgency to eliminate plastic, including Styrofoam, which further opens the door for paperboard alternatives.”

Sedlacek highlighted a few of GPI’s recently introduced paperboard alternatives:

**ecotainer.™** Currently, GPI offers its ecotainer line of hot and cold cups and...
food containers that have plant-based, compostable (in most commercial composting facilities) or easily recyclable barrier coatings which eliminate plastic film barrier linings.

“We consider our ecotainer line of products to be the next generation of hot and cold foodservice packaging,” Sedlacek pointed out.

Notably, GPI says that it will sell a PE-free cup (100% plant based) in 2020 that is commercially viable for the marketplace. The cup will be 90% renewable, recyclable, and commercially compostable.

**KeelClip.™** Sedlacek also mentioned the company’s KeelClip, a paper fastener that replaces plastic rings, tops and shrink wrap, and offers a printable surface area, provides merchandising benefits over the plastic rings.

“Our KeelClip is designed to be a replacement for the ubiquitous plastic rings and shrink wrap film used widely in beverage packaging. KeelClip is a proprietary paperboard solution that can replace both options with a superior sustainability profile. This solution provides excellent performance through the distribution channels and is recyclable,” Sedlacek added.

KeelClip fasteners are applied with the KeelClip 1600, a high-speed system designed specifically for the paperboard fasteners.

And in a first quarter 2020 earnings call with analysts, Mike Doss noted that GPI continues to see excellent traction on its KeelClip technology. “We have sold over 20 KeelClip machines,” he said.

**Paperboard trays.** Another product line in the vein of sustainability are paperboard trays designed to replace plastic trays. GPI produces pressed trays and bowls for both conventional and microwave cooking; trays for take-out and to-go foods for the foodservice industry; and new innovations in high-barrier paperboard trays for fresh and processed meats, dairy and more.

**Sustainability Vision 2025**

On the environmental and sustainability front, Graphic Packaging is pursuing an ambitious plan called “Sustainability Vision 2025.” Under the plan’s umbrella are four major categories that the program targets: partners, profit, planet and people. For the purpose of this story, we’ll stick with the list of environmental goals GPI expects to reach by 2025:

- Reduce greenhouse gas emissions by 15%;
- Reduce non-renewable energy use by 15%;
- Reduce mill water effluent by 15%;
- Make 100% of GPI products recyclable; and,
- Reduce thermoplastic LDPE (low-density polyethylene) use by 40%.

Beyond future environmental goals, Graphic Packaging utilizes essentially all the wood that comes into its virgin paperboard mills, either to manufacture paperboard or to produce power through biomass, while its CUK and SBS mills generate most of their electricity from renewable energy sources and send excess energy (where available) back to the local power grid.

Virtually all of the company’s paperboard products are recyclable, and for those that aren’t widely accepted, GPI is working to find solutions to recapture the fiber to make new products.

**Notes:**

1 Graphic Packaging Holding Company 2019 Annual Report.
Development of Fiber Modification Technologies for UBK Fibers Using a Novel Analytical Method

The effect of enzymatic treatment to condition fibers prior to refining has been used mostly in bleached and recycled fibers. Although the application of these technologies in unbleached Kraft has been more challenging, a new enzyme-based technology has been developed that has proven to be very effective in unbleached Kraft.

In an increasingly competitive market, you must control costs if you want to survive and prosper. The fiber-based packaging industry is striving to remain competitive and profitable while meeting the increasing demands of its customers for stronger and lighter product while replacing plastic-based packaging.

To meet market demands most mills are using costly levers in order to achieve strength targets: using polymeric/starch solutions, adding basis weight, reducing speed, increasing refining and managing fiber quality. These can create unintended consequences in the process, and in many cases, they are vastly overused. Even with all these tools, sometimes mills are unable to meet market demand for quality and strength-to-weight ratio, resulting in rejected or discounted product.

All these strategies work but are used to the point of diminishing return, increasing cost and introducing instability to the process. Some of these approaches also limit your mill’s ability to increase production. Some require more chemicals overall, which will impact system stability and cost.

The mechanical treatment of wood pulp fibers is used to impart to them the appropriate characteristics for papermaking. A part of the stock preparation phase of papermaking, refining is the most important aspect of the process. It is here that the characteristics of the cellulose fibers and the composition of the furnish that comprise paper are determined, affecting how the fibers bind with each other during the formation of the paper web and what the various properties of the paper will be.
Enzymes for Fiber Modification

Wood fibers are mainly composed of cellulose and hemicellulose microfibrils encrusted in lignin-carbohydrate matrices. They are multilayered structures that can have internal delamination and external fibrillation after chemical and/or mechanical processing.

Wood pulp can be treated with enzymes, and some of the cellulose in the fiber is hydrolyzed. This biochemical treatment reduces the amount of mechanical treatment needed to reach the desired fiber properties. Less mechanical action and less energy are required. Since refining requires significant energy input, as well as capital investment for equipment, facilitating the refining process provides numerous benefits, including stronger paper, elimination of other chemical additives and reduced energy usage.

Properly applied enzymes can enhance fiber strength, reduce refining time and increase interfiber bonding though fibrillation. The main challenge in using enzymes to enhance fiber bonding is to increase

Figure 1. Schematic representation of probe binding to a wood fiber. The left side of the fiber shows a lignin free fiber, where amorphous cellulose dominates (cherry strings). On the right side, the straight green bars represent crystalline cellulose. Hemicelluloses such as xylan (orange) and mannans (blue) are shown as polymers that help keep the fiber together. The probes designed here attach specifically to their respective target polymer, as indicated by the matching color of their fluorescent module (Hebert-Ouellet et al. 2017).

Figure 2: Surface characterization results for the four substrates across three treatment groups on hardwood (HW) and softwood (SW) furnish. A) Amorphous cellulose, B) Crystalline cellulose, C) Mannan and D) Xylan. Values provided represent the mean of at least three samples.
fibrillation. Enzymes used to modify the fiber do on a molecular level what mechanical refining does on a macro level. These enzymes break bonds in the cellulose chain, thus weakening the surface of the fiber and resulting in the same effects, collapse and fibrillation, that mechanical refining does.

**Fiberlytics™: A Novel Characterization Technique**

The fiber's physical and surface properties vary based upon the species of the fiber present, the way the fiber was prepared and even the growing conditions and location of the original tree. Currently there are few ways to understand the variability in fiber and how to mitigate the process variation this introduces. In essence, customers are unable to independently validate the quality of the incoming fiber, meaning that the fiber they use today may not be similar to the fiber they used yesterday or the day before that. This can result in significant swings in product quality, runnability and production as operators respond to shifts in fiber property reactively.

In the last few years, we have focused on developing new screening techniques that can provide a greater understanding of how specific enzymes interact with the different cellulotic fibers and can accelerate the product development phase. This novel characterization technique provides a better understanding of what types of cellulose and hemicellulose are present on the surface of the fiber. This information, combined with the known activities of the enzymes, is critical to enzyme selection.

This new technique has also sped product development efforts resulting in new a product that proved very effective for unbleached Kraft fibers.

Utilizing this fiber surface characterization method in the development phase, it has become possible to select the ratio of enzyme activities to best match the ratio of the substrate. In matching the activity profile to the substrate profile of the fiber itself, it was possible to shortlist the product that was predicted to have the best impact on the final process in a short period of time.

**Laboratory Work**

Extensive work was done to demonstrate the potential of the fiber surface characterization method, which was first published in 2018. During the development of Maximyze® 777 for unbleached Kraft fibers, representative softwood (“SR”) and hardwood (“HW”) samples were treated with either a strength resin alone (“SR Only”) or with a combination of strength resin and enzyme product (“SR + Enzyme”) and compared to untreated fiber (Figure 2). In comparing the levels of amorphous cellulose in the samples, the data showed that levels increased with the addition of strength

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**Figure 3:** Summary of tensile data. Values provided are the mean of at least seven measurements.
resin, but that a further increase was achieved in the presence of enzyme. The crystalline cellulose signal was seen to decrease between the control and the two treatment groups, with the lowest signal being observed in the enzyme treatment group. Similar levels of decrease were observed in the levels of mannan and xylan. The data is interesting because it showed a change in substrate prevalence even when a non-enzymatic treatment was added. The action of the enzyme is clearly observed in the concurrent increase in amorphous cellulose and decrease in crystalline cellulose.

To further understand how these changes in signal relate to the strength characteristics of the sheet, a handsheet assessment of tensile strength was executed (Figure 3). The data shows that both treatment groups were able to improve the tensile strength significantly versus the untreated control. This result supports the importance of the crystalline:amorphous cellulose ratio (Hébert-Ouellet et al. 2017), as both treatment groups showed a reduction in crystalline signal and an increase in the surface-available amorphous cellulose. Furthermore, the improvement in strength correlated with the trend in ratio between the two treatment groups, supporting that the surface characterization method has predictive power.

In utilizing Fiberlytics™ in the selection of enzymatic products, it becomes possible to select the ratio of enzyme activities to best match the ratio of substrates. In matching the activity profile to the substrate profile of the fiber itself, it was possible to find the best formulation for unbleached Kraft fibers. In combining knowledge of the fiber surface with the activities of the enzymes under specific operating conditions, it now becomes possible to rapidly identify enzymatic technologies that deliver the specific benefit required (Figure 4).

**Conclusions**

Prior to the development of the new characterization technique, several attempts have been made to develop a product that was highly effective in unbleached Kraft fibers with limited success. In understanding the composition of the fiber surface with respect to substrate, this novel technique provides a unique opportunity to understand the fiber at a level that is relevant to the action of enzymes. The data reinforces that fiber surface characterization is both a useful diagnostic tool to assist in understanding the impact of process change and enzyme selection but also can be used predictively in selecting new enzyme technologies for given applications.

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Roll Covers from Recyclable and Renewable Raw Materials

Could roll covers be made of recycled or even bio-based materials? With less than two years’ intensive R&D work, Valmet has taken a remarkable step toward a more sustainable era in the field of production consumables in papermaking.

By Jani Turunen and Juha Ruotsi

Roll covers used in paper, board, tissue and pulp making need periodical renewal and thus consume tonnes of material resources. A major part of the raw materials used in roll covers – polymers, resins and other industrial chemicals – has traditionally been manufactured from fossil-based raw materials, and refined and processed from crude oil. The manufacturing methods for these raw materials may also have been energy consuming. Old roll covers have ended up in landfill or as energy waste.

A More Sustainable Future with a New Generation of Roll Cover Materials

Safety has always been the highest priority, and over the years Valmet has frequently replaced raw materials in roll cover production with safer alternatives. Where raw material selection was previously heavily guided by worker safety, Valmet is now taking a giant leap toward a more holistic approach with a focus on sustainability, aiming to replace as many of the roll cover raw materials as possible with more sustainable alternatives. The target is to use recycled materials and renewable resources, and more broadly to save energy.

Using recycled consumer plastic or glass as the reinforcing fiber or filler in composite roll covers, or bio-based resin and hardener in the polymer matrix, are good examples. The benefits
of recycling are easy to understand, but what about bio-based materials?

“They remove the dependency on crude oil,” states Dr. Jani Turunen from Valmet. He continues: “We only approve renewable materials derived from non-food chain plants or plant parts, meaning their use does not affect global food production. Cultivation and harvesting of plants must not endanger the growth of natural forests either. In the best cases, bio-based materials can be produced from plant parts that would otherwise be waste. Lignin, carbon black made of lignin and nanocellulose are good examples, and all three can be utilized as reinforcing fillers in roll covers.”

The target is to produce roll covers based on 100% recycled or bio-based raw-materials.

Innovativeness and a Strong R&D Pay Off

After less than two years of intensive R&D work for sustainable roll covers, Valmet is ready to present the first more sustainable composite covers for press, guide and calender rolls. The content of recycled or bio-based raw materials is between 75 and 96 percent in these covers, but new materials are being continuously tested, and the target is to reach 100 percent as soon as possible.

Work is also being done on polyurethane and rubber covers, and their first customer prototypes may already be available later this year. Last but not least, studies are also ongoing on how the scrap material from removed covers can be optimally recycled or utilized.

“We’ve already been in touch with companies that are breaking the rubber (tires) down back to oil, carbon black and fuel with the help of their pyrolysis process. The carbon black could then be recycled to produce new rubber roll covers,” reveals Turunen concerning Valmet’s future plans.

No Need for Compromise

When we’re talking about more sustainable alternatives and recycled products, it’s relevant to ask about product performance. Valmet’s R&D work shows very promising results here too.

“We were actually surprised with the laboratory results we obtained from these sustainable covers. Some of the properties, like wear resistance, were even better than with our standard roll covers,” says R&D Engineer Pertti Hytönen. “Of course, we’re still at the beginning, and creating products as good as our state-of-the-art offerings may take a few years. But even in those products at least some of the raw materials can already be replaced with more sustainable options.”

Examining the most important roll cover properties and requirements – for example, in the results achieved in pressing or calendering – shows that users don’t need to compromise on product performance.

Make a Difference to Our Environment

To summarize, the benefits of sustainable roll covers are clear: good performance in the papermaking process and a solid way for paper companies to prove they are acting to make planet Earth a better place for future generations.

Jani Turunen is Manager for Roll R&D, and Juha Ruptsi is Global Technology Manager, Valmet. For further information, contact Jani Turunen at: jani.turunen@valmet.com.
Simulating the Properties of Pulp, Paper and Board

Metsä Fibre’s Furnish Improvement Tool (FIT), which was originally developed for the analysis of pulp grades, now has simulation capabilities for paper, board, and in the not too distant future, tissue.

Metsä Fibre’s Furnish Improvement Tool (FIT) utilized by its technical customer service can be used to quickly and cost-effectively evaluate and modify paper and board furnish- es. According to the company, optimization of the stock furnish results in the best possible final product quality, more efficient production and lower production costs.

“The Furnish Improvement Tool (FIT) is the most important tool in our technical service portfolio,” says Esko Pekuri, Metsä Fibre’s Technical Customer Service Manager.

The FIT tool is used daily for benchmarking pulp grades used for base papermaking, as well as for reforming existing base paper furnishes and simulating new paper and board grades. It can also be used to conduct precise cost studies, and investigate and compare the cost structures of simulated products.

FIT has replaced time-consuming laboratory tests and the manual analysis of results. A well-functioning simulation model may even provide more precise results than individual laboratory tests.

“The tool speeds up comparisons and development work considerably. For example, a beating comparison of ten different pulp grades in our database can be performed in a couple of minutes. Optimization of the final product can take a few days. Before the introduction of the tool, the implementation of a corresponding study might take up to six months,” Pekuri says.

The improvement of the simulation process is based on an advanced model, an extensive pulp database, the artificial intelligence included in
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<table>
<thead>
<tr>
<th>COMPANY</th>
<th>PAGE</th>
<th>WEBSITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldon Company</td>
<td>15</td>
<td>aldonco.com</td>
</tr>
<tr>
<td>Buckman</td>
<td>2</td>
<td><a href="http://www.buckman.com">www.buckman.com</a></td>
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<td>Dienes</td>
<td>7</td>
<td><a href="http://www.dienesusa.com">www.dienesusa.com</a></td>
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<td>Edwin X. Graf</td>
<td>29</td>
<td><a href="mailto:headbox@aol.com">headbox@aol.com</a></td>
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<td>13</td>
<td>esscoincorporated.com</td>
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<td>Kadant</td>
<td>31</td>
<td><a href="http://www.kadant.com">www.kadant.com</a></td>
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<tr>
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<td>5</td>
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<td>Papermachine Service Industries</td>
<td>29</td>
<td>papermachine.com</td>
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<td>32</td>
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the software and specialist expertise.

“FIT directly suggests the ten most affordable simulation options found in the database, based on the quality criteria provided. This significantly speeds up the work. From these options, our experts select the ones that function best, and start finalizing the mix option manually,” Pekuri explains.

Simulation Expertise Offers an Important Competitive Edge

Development of the FIT tool was started in cooperation with GloCell Ltd in 2008. At the same time, Metsä Fibre started building its own pulp database, suitable for comparison and simulation use. Currently, the database now includes hundreds of pulp furnishables.

To start with, GloCell collected pulp beating data in a single system to facilitate the comparison of beating curves and creating new mixes. The result of application development spanning more than a decade is that the tool has evolved into a comprehensive modern SaaS service.

“Through long-term cooperation, we’ve learned to make use of the FIT tool effectively and in a variety of ways. Now, its simulation capabilities and our extensive pulp database provide us with a significant competitive advantage,” Pekuri says.

From Paper to Board and Tissue Simulation

The development work has considerably increased the properties and applications of the FIT tool. In the field of papermaking, pulp fillers and floating basis weight, among other things, have been included.

At the beginning of the last decade, the development of a more challenging multilayer model was started for the tool to enable simulating liners and multilayer boards. Today, it can be used to simulate all the board’s structural and strength-related main properties. The impact on production costs from changes in board furnishes can also be calculated precisely.

“The last stage of software development for board simulation was completed last year. We added properties related to the tensile strength and stretch of fiber networks to the model to enable the simulation of the folding endurance of board. In addition, models for the burst and compression strength properties, important for liner product makers, were completed.

“The model now also makes use of differences between individual board machines in addition to the raw material used. The simulation of the final product takes machine-specific differences into account in addition to the raw material, thereby decreasing the number of test runs needed during the testing phase,” Pekuri says.

Now that the paper and board models have been introduced in commercial use, GloCell, Metsä Fibre and Metsä Tissue are developing the FIT tool for the needs of tissue production. A model that can be used to study the impact of base paper creping on paper strength is being researched.

“We’re currently in the feasibility study phase regarding creping. Our goal is to create a preliminary model during 2020,” Pekuri concludes. ■
Proper installation and repair of your dryer equipment will maximize drying capacity by keeping all the dryers in service. Kadant has the specialized knowledge and experience for safe, reliable, and expert installation of your rotary steam joints, syphons, dryer bars, and related equipment.
With as many as 4,000 refiners installed in North America, and over 10,000 worldwide, Valmet is the industry leader in delivering end-to-end refining solutions. Reinforced by the expertise and technology from legacy manufacturers GL&V and J&L Fiber Services, Valmet delivers the options you need to optimize process efficiency and move your refining performance forward. Learn about our expanded portfolio of refiners, refiner segments, refiner services and automation at valmet.com.