TAPPSA Journal

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JOURNAL FOR THE TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY OF SOUTHERN AFRICA

TECHNICAL PAPER

Pulp and paper mill sludge
A potential resource for producing high-value products

SUPPLIER CASE STUDIES

Ahead of the pack in South African
carton board manufacture

Raising the bar in
cleaning performance

JAM-PACKED
HEALTH AND SAFETY FEATURE

OPINION PIECE

[Your business is not as energy efficient as you imagine]

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TAPPSA

Audit Bureau of Circulations of South Africa
transparency you can see

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Bitter pill of rejection

Dear reader,

Welcome to our first issue of 2017. In case you missed the news, in 2016 we took the decision to publish quarterly issues instead of six bi-monthly issues. As always we welcome your suggestions for improvement and contributions to upcoming issues. Thanks to those who have provided suggestions for a more readable layout; I hope that our larger and darker font makes the Journal easier on the eyes.

As I write this, it has been five days since I completed my very first marathon. This entailed 42.2km and five and a half hours of running (oh, and lots of walking). During the race, I had to come to terms with the fact that I might not qualify with a sub five-hour time for my first Comrades marathon.

It was only in September last year that I decided to enter South Africa's craziest ultra-marathon, despite countless utterances that I would never consider running 87-odd kilometres between Durban and Pietermaritzburg. I set out to do the miles and the time on the legs, and figure out how not to run to like a tortoise through mud.

It was a long, slow morning with lots of encouragement from my more experienced running partners. There were moments of sheer anguish and self-doubt, but I persevered. Coming into the finish with fellow (and faster) club members cheering me in, I was thrilled just to have completed it. And there will be other opportunities to qualify.

There are always more opportunities and ways to improve, which brings me to matters closer to TAPPSA. As you may know we applied for inclusion in the Department of Higher Education and Training (DHET) approved list of accredited journals last year. It has been a two-year process – the first attempt in mid-2015 saw our submission being mislaid and never making it to the right people. We could only reapply in June 2016. We waited patiently until December 2016 for the outcome, only to receive official notification in February 2017.

DHET informed us that the TAPPSA Journal was rejected for inclusion, citing the reason as 'there is only one original research article in the latest volume(s). Therefore the journal does not meet the policy requirement of having at least 75% of the subsidised contributions published in the journal emanating from multiple institutions'.

A list of metaphors and idioms spring to mind. What comes first, the chicken or the egg? How do we attract the requisite research submissions without having the reciprocity of accreditation that would benefit the researcher? It's a tough nut to crack, and wedges us right between a rock and a hard place. You get my drift.

There are other avenues we will pursue but in the meantime, we invite your thoughts on the matter. Drop an email to Iain Kerr, our TAPPSA chairman, on kerr@ukzn.ac.za or to me on editor@tappsa.co.za.

Samantha Choles

Machine Tools Africa

EXPO CENTRE NASREC, JOHANNESBURG | 9-12 MAY

www.machinetoolsafrica.co.za

INDUTEC 2017

GALLAGHER CONVENTION CENTRE, MIDRAND | 17-19 MAY

www.indutecafrica.com

Africa's biggest trade show for pumps, valves and pipes will have a new international focus at INDUTEC 2017 in Johannesburg over three days. It is dubbed as Africa's leading industrial technology and supply expo dedicated to the industries involved in the conveyance of liquids, gases and slurries.

Two conferences will be also be presented alongside the event: Pumps, Valves and Pipes (PVP) Live and Water Tec.

Now in its 10th edition, INDUTEC was acquired last year, along with four African shows, by dmg events Middle East, Asia and Africa, and the expo has undergone a makeover to bring it into line with dmg's international portfolio.

Africa's renewed growth is offering new opportunities to PVP suppliers in sectors as diverse as water supply and oil extraction through to agriculture, pulp and paper and construction.

"INDUTEC is a well-established expo in South Africa attracting visitors and exhibitors from around the world," says Brad Hook, dmg-ems Africa's Commercial Director. "This year we will will focus on the five key areas of the market at both the show and the conference."

- **Energy**. To meet demand in the oil, gas and petrochem sector for economic pumping and transport solutions to capitalise on the continent's reserves.
- **Infrastructure**. New government backed developments mean expertise is required across a diverse range - from the transportation of liquid concrete to sewage.
- **Water**. Focus in sub-Saharan Africa has focused on water security with municipalities investing money in long-term solutions.
- **Agriculture**. Mechanisation and population growth is increasing demand for the latest pump and pipeline technology.
- **Extractive industries.** Africa is a world player now demanding the efficient solutions from oil and gas transportation to mining.

CEPI European Paperweek

BRUSSELS, BELGIUM | 28-30 NOVEMBER

RISI has partnered with CEPI to host the annual PPI Awards on 29 November.
www.cepi.org/EPW

Visit www.tappsa.co.za for a more comprehensive list of events.

17-18 MAY 2017

Automation University in South Africa

A two-day training programme providing leading-edge automation solutions

Automation University Classic, a comprehensive two-day training programme from Rockwell Automation open to everyone interested in leading-edge automation solutions, from engineers to business managers, will be hosted in South Africa this year.

Rockwell Automation Sub-Saharan Africa will welcome participants at Emperors Palace in Gauteng on 17 and 18 May. Targeted at systems integrators from management and engineering through to IT and purchasing, this year's theme is The Connected Enterprise – Smart Productive Secure.

Automation University is designed to give these professionals the opportunity to discuss current and emerging challenges within the industry, incorporating news, views, trends and technologies of integrated information and automation solutions. It consists of over 50 different hands-on laboratories, demonstrations and presentations relating to the products and services offered by Rockwell Automation. The format allows customers to plan a program specific to their needs while industry seminars, presented by experts in their field, will be conducted for the mining, oil and gas, water and wastewater, consumer and automotive industries.

Delegates will see the latest automation and information advances. As part of the overall experience there are two grand tours of the Automation University show floor, which have been set up to showcase Rockwell Automation equipment and solutions while also encompassing those of their partners. Rockwell Automation is in the process of validating this event through the SAIEE for CPD credits.

Registration began in February and interested parties can submit their details by visiting www.automationuniversity.eu. AU 2017 attendance is free, but travel and accommodation are for delegates' expense.

David Hathorn to hand reins to Peter Oswald

Mondi Group CEO David Hathorn will be handing the reins to Peter Oswald, currently an executive director and CEO of the Europe and International Division, at the conclusion of the Annual General Meetings on 11 May 2017. Until then, David and Peter will work together to ensure a seamless transition. Once Oswald assumes the full responsibility as the Group CEO, David will support him as required and continue to work in an executive capacity until his retirement in February 2018.

Oswald graduated in law from the University of Vienna and in business administration from WU-Vienna Business School. He has over 25 years' experience in the packaging and paper sector with detailed knowledge of operations and extensive experience of the acquisition, disposal, restructuring, turnaround and organic growth of businesses. He began his career with Deutsche Bank and automotive company KTM. He joined the Frantschach Group in 1992 as the head of internal audit, later becoming corporate controller.

After serving as chief executive of the bag and flexibles business from 1995 to 2001, Oswald was appointed chief executive of Mondi Packaging Europe in 2002, leading its subsequent integration with Frantschach into the new Mondi packaging division. Having held a number of senior executive roles within Mondi, he was appointed chief executive officer of the Europe & International Division in January 2008. Oswald was a non-executive director of Telekom Austria AG between 2008 and 2014 and of MIBA AG between 2014 and 2015 and chairman of the supervisory board of OMV AG between 2015 and 2016. He is currently serving as chairman of the Confederation of European Paper Industries (CEPI). In 2013, Peter was named European and Global CEO of the year by RISI, a leading information provider for the global forest products industry. He will continue to be based in Vienna.

Joint chairmen, David Williams and Fred Phaswana, commented: "David has made an immense contribution to the growth and development of Mondi. We are delighted to have someone of Peter's calibre and experience to succeed David as CEO. Peter is a proven leader with an intimate knowledge of the business, having been involved in the development of much of what comprises the Group today. We are confident that Peter will offer strong continuity, while bringing his own dynamism to the role. We look forward to David and Peter working together to ensure a smooth transition of leadership."

Commenting on his appointment, Peter Oswald said: "I am honoured to accept the appointment and look forward to working with the Boards and the rest of our team in continuing the successful development of the business. With our clear and consistent strategic focus, robust business model, world class assets, rigorous and disciplined approach to capital allocation, and strong financial position, we are well equipped to serve our growing customer base and deliver the ongoing success of the Group for the benefit of all stakeholders."

Look out for our interview with David Hathorn in the Quarter Two issue of TAPPSA Journal.

CSIR welcomes new CEO

The Council for Scientific and Industrial Research (CSIR) has welcomed Dr Thulani Dlamini as its new CEO. Dlamini is no stranger to the council. He joined the CSIR in 2005 as the head of the CSIR National Laser Centre and in 2008 he was appointed to the position of Group Executive for Research and Development, a position he held until 2011 when he left the CSIR to join Sasol. At Sasol he was the Executive Manager: Research and Development and later became Vice-President for Strategic Research and Technology. Dlamini holds a PhD in Chemistry from the University of the Witwatersrand (Wits) and a Master's in Business Leadership from the University of South Africa (UNISA). He was instrumental in the establishment of the Photonics Initiative of South Africa and the development of a national strategy for photonics research, development and innovation. He is a member of the Academy of Science of South Africa (ASSAf). Furthermore, he has served on numerous boards including the Sasol Pension Fund, Automotive Industry Development Centre, Sasol Technology UK and Netherlands.

Archroma receives Eco-innovation Award for sustainability initiatives from WWF Pakistan

Archroma received the Eco-innovation Award from WWF Pakistan at the organisation's Annual Green Office Network Meeting in Karachi in December. The award is a recognition of Archroma's efforts to foster sustainable innovations aimed at preserving dwindling ground water reserves, and developing eco-efficient processes that reduce energy, process time and resource consumption. Pictured here are Iffat Zahra and Arshad Mehmood, Archroma, receiving the WWF Pakistan Eco-Innovation Award from Naeem Mughal, Director General, Sindh Environmental Protection Agency, Government of Pakistan.

Basics of stores and stock control accredited by Sapics

A pilot programme has been under way at Twinsaver's Bellville and Pretoria West warehouses. Accredited by Sapics, an organisation that represents the supply chain community, the course covers the principles of stores, warehousing and the essential disciplines required to maintain control in a warehousing environment.

Four employees at the Bellville warehouse participated in a three-month programme with Optimum Learning. They successfully completed 13 modules with three of them passing *cum laude*. The employees from Pretoria West all passed their November exams. Congratulations.

ABOVE Clockwise from top left: Martin Louw, Brandon Cornelissen, Shirley-Ann Baron and Chrislynn Adams.

CLOCKWISE FROM TOP LEFT Virushin Naicker - BTech 1st year; Thokozani Mkhwanazi - BTech 1st year; Nkosinathi Mahwai - BTech 2nd year; Kerishan Govender - BTech 2nd year; Avela Hlatuka - BTech 1st year.

Mpact Piet Retief helps employees get ahead

In the tradition of all employees across all divisions being empowered, Mpact Piet Retief took the initiative to partner with DUT for BTech Pulp and Paper Technology employees-students and Umfolozi TVET College for entry level employees. Both programmes will assist employees in furthering their studies from N1 to N3 in the Pulp and Paper Operations course.

Piet Putter, senior education, training and development practitioner at Mpact, thanks PAMSA and the FP&M Seta for its funding. He also congratulates Donald Marshall (maintenance fitter), Bongani Sithole (quality control inspector), Bongani Msholo (shaker screens attendant) and Nkosinathi Nhlabathi (waste plant operator) for completing their PPOP studies at an N3 level.

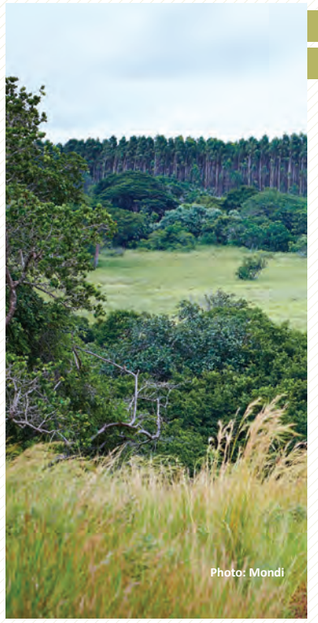
Eighteen employees are currently registered on the programme and four completed their N3 qualifications during the final semester of 2016.

Five employees are registered for the BTech course: Virushin Naicker (electrical engineer in training), Avela Hlatuka (laboratory analyst) and Thokozani Mkhwanazi (pulp mill DCS operator) have just completed their first year, while Kerishan Govender (process engineer) and Nkosinathi Mahwai (mill chemist) have completed their final year. Mpact wishes all its employees good luck in their respective studies.

Award season for Mondi

PPI Award for fire protection programme

Mondi's Technical Department was the winner of the 2016 PPI (Pulp and Paper International) Award in the category of 'Resilience – Managing Risk' at PPI's Awards ceremony in Brussels in November. The award recognised the excellence of Mondi's Fire Protection Code (FPC) programme. Since 2013, Mondi's Technical Department has overseen the implementation of 200 projects that aim to reduce or eliminate the risk of fire throughout the Group's operations. As a result there have been significantly fewer reported fire events and a related reduction in asset losses. Mondi's property and equipment are better protected and the Group also benefits from lower property insurance costs. Adnan Delic, Group Technical Risk Manager, accepted the award on the company's behalf (**RIGHT**).



Recognition in three categories of WWF's **Environmental Paper Awards 2016**

Mondi Group was recognised in three categories of WWF's Environmental Paper Awards for 2016. In the 'Transparency' category, Mondi was recognised for publishing the forest, climate and water footprint of 92% of its uncoated fine paper brands, while under 'Best Environmental Performance - Paper Brands', 32 of Mondi uncoated fine paper brands received this award, reaching over 80% of achievable scores. Its packaging paper brands were recognised for using a proactive approach in assessing the forest, water and climate footprint for internal purposes, using WWF´s Check your Paper Method within the 'Striving for Continual Improvement' category.

Mondi and WWF have worked together over many years and in 2014 entered into a three year strategic partnership that focuses on promoting environmental stewardship in the packaging and paper sectors, minimising the impacts of Mondi's operations on forests, climate and water and sharing information to encourage sustainable practices in the industry.

Peter Orisich, CEO Mondi Uncoated Fine Paper, added: "At Mondi we attach great importance to the sustainability of the wood, fibre and paper we source and strive to act sustainably – every day. The productive capability, biodiversity and community needs of the forest plantations that we own, manage and source material from are key elements of our management approach and systems. WWF's Check Your Paper scheme is an excellent benchmarking tool that helps us to illustrate our commitment to transparency and improve the environmental footprint of our papers".

Twinsaver Group talent development initiatives yield positive results

Last year, the Twinsaver Group Skills Development Programme had a busy year, with a number of successful projects.

Adult education and training

On 20 September, Twinsaver kick-started its adult education and training project aimed at improving and developing employee English literacy while also providing basic foundational learning tools, knowledge and skills. The project serves to provide participants with nationally recognised skills and/or qualifications. An impressive 46 employees are participating in the programme.

Supervisory development

One of the Twinsaver Group's objectives is to create a high performance culture among operational supervisors and managers. The Generic Management NQF4 qualification has been identified as a management tool to provide supervisors with the skills they need to effectively set team objectives, plan and organise resources, track performance against objectives, solve problems and make decisions. Employees practise by using management tools in the classroom and are empowered with a practical toolkit for use in the workplace. After the successful completion of this 12-month programme, they will obtain a Generic Management NQF4 qualification.

Employees share information during a practical classroom session

Paper packaging packs a punch

Whether made from virgin or recovered fibre, paper packaging in particular is unique in its renewability and sustainability. In South Africa, trees are farmed for their fibre and are replanted within the same year of harvesting while pre- and post-consumer fibre recovery diverts a valuable raw material from landfill. Add to this recyclability and biodegradability, and paper packaging comes up trumps compared with other substrates.

Packaging also plays a vital link between farm and fork. Strength, high humidity performance and convertibility are some of the key attributes needed to ensure product freshness – from harvesting and cold storage, packaging and transportation, to final point-of-sale.

South Africa has been subject to some climatic extremes over the past few years – from severe drought to incessant rains. Producing a crop in these conditions is not the only challenge they face. Part of their challenge is to get their produce delivered fresh from the farm to the market or shelf.

"Farmers and converters want to ensure that fresh produce is delivered unscathed throughout the supply chain, but they also need packaging that is versatile, value-for-money, environmentally friendly and sustainable." So says Richard Wells, sales and marketing director of Sappi's Paper and Paper Packaging division in South Africa.

"We are as passionate about our paper packaging as farmers are about their produce," says Wells. As such, the company has made it their business to understand farmers' needs, as well as the rigorous demands on the vulnerability of fresh produce along the supply chain.

Sappi has recently reaffirmed the importance of the containerboard market segment to its business and future growth with packaging portfolio consisting of virgin liner, semi-chemical fluting and test liner.

Sappi's linerboard and the fluting product – Ultraflute – count among its containerboard range manufactured to address the challenges of form, function and resilience. Ultraflute, for example, is used for high-end, heavy-duty agricultural and industrial packaging. As such, its high virgin fibre composition gives it superior strength, resulting in stronger boxes, with improved stacking strength and multiple yield advantages. High humidity performance ensures that produce sent to market via the cold chain – such as fruit, vegetables, frozen fish and meat - arrive at their destination fresh and undamaged. Ultraflute is excellent in withstanding changing cyclic humidity conditions and maintains this strength for long periods.

In terms of convertibility (which is influenced by paper properties and machine running speeds), Sappi's products offer improved flexibility and tensile, stretch and tear properties. These factors allow for increased corrugator speeds and the optimum use of raw materials.

"Strength and performance are not the only requirements for sustainable, quality packaging. Manufacturing processes aimed at protecting our planet are equally important," notes Wells.

"The fibre used in Sappi's processes are derived solely from sustainably managed plantations; never from indigenous or rain forests," assures Wells. The company's plantations are certified in terms of internationally recognised environmental and quality standards (ISO 14001 and ISO 9001), and carry the Forest Stewardship Council® (FSC®) stamp of approval.

Sappi's containerboard products are also biodegradable and recyclable, making them an environmentally responsible choice for farmers, converters and retailers alike.

BASF brings a triple-E to the packaging industry:

environment, ecology and economy

In May this year, BASF experts and specialists from BTC Europe (BASF's distribution organisation) will be at Interpack 2017 in Düsseldorf presenting a wide range of products and innovations from its packaging portfolio. The broad range of products offered by BASF is focusing on packaging products that reduce the environmental and ecological footprint while still being an economically viable option.

Biomass balance

Using the concept of biomass balance for the packaging industry, renewable raw materials are used as feedstock in the beginning of BASF's integrated Verbund production system and then allocated to specific sales products. As a consequence, these products save fossil resources and help to reduce greenhouse gas emissions. An independent third party validates the required amount of renewable raw materials and certifies the sales product.

Polymer protection

The company has three different polymer solutions which can act as a functional barrier coating for paper and cardboard: Ultramid® (PA), Polybutylenterephthalat (PBT), as well as ecovio® as a biodegradable solution for barrier coatings. Each coating solution offers unique valuable properties in the field of paper and cardboard coating.

Barriers for thin-walled, injection molded food packaging

Ultradur®, a partially crystalline saturated polyester used in single-serve coffee capsules, offers improved oxygen barrier properties than commonly-used polypropylene (PP). Using PBT instead of PP in the containers also allows for the removal of aluminum film as a needed secondary packaging. Better oxygen barrier properties keep the coffee fresher for a longer time, helping to increase shelf life time of the food products.

Biodegradable polymers

Compared to conventional plastics, ecoflex® offers certified compostability on a fossil basis. As an innovative pioneer in the field of biodegradable polymers it is an important raw material for many compostable and biobased plastics.

ecovio® is a high-quality and versatile bioplastic with the advantage of being certified compostable and containing biobased content. The main areas of use for ecovio® are plastic films such as organic waste bags, dual-use bags or agricultural films. Compostable packaging solutions such as migration barrier coating on paper, foam packaging and injection molding products can also be produced with ecovio®.

Water-based solutions for flexible packaging

BASF's water-based brands Epotal® and Joncryl® are a sustainable alternative to solvent-based products and achieve in most cases a comparable performance as solvent-based inks or adhesives.

With Epotal® lamination adhesives, BASF offers new options to the flexible packaging industry: the high initial bonding strength of water-based adhesives allows for direct slitting of the laminates. Curing times are almost not required since water-based adhesives are already fully-reacted adhesive systems. They bring increased flexibility to the customer by significantly shortening lead times and making printing and lamination in-line possible. Additionally, water-based adhesives - due to their chemical composition - are inherently safe systems and well suited for food packaging applications. They do not contain any organic solvents nor aromatic isocyanates. The migration potential is virtually eliminated.

The Joncryl range offers high-performance resins that enable flexible packaging printers and converters to switch from solvent-based to water-based technologies. The Joncryl® FLX portfolio can be considered as the reference in resins for water-based film printing inks. With their excellent resistance and lamination bond strength in combination with high resolubility, they are highly suitable for flexible packaging applications. The Joncryl® HSL product line offers options for heat seal lacquers in various applications, providing secure seal and smooth peeling behavior.

PEF: Synvina aims world-leading position

Synvina, the joint venture of BASF and Avantium, aims to drive the market in furandicarboxylic acid (FDCA) and polyethylenefuranoate (PEF). FDCA is produced from renewable resources and an essential chemical building block for the production of PEF, used in food packaging, films and plastic bottles. Compared to conventional plastics, PEF is characterised by improved barrier properties for gases like carbon dioxide and oxygen. Due to its higher mechanical strength, thinner PEF packaging can be produced and a lower amount of packaging material is necessary. PEF can be recycled.

Superior mirror and liquid metal effects from pigments

BASF's *Color & Effects* brand is presenting pigments for sensitive applications for printing and plastic applications and the Metasheen® product line. Metasheen is a vacuum metallised pigment (VMP) that allows formulators to print metallic, mirror-like features instead of using metallised substrates or hot-stamping/cold foiling.

Make 2017 a Golden Year

The Institute of Packaging SA (IPSA) Gold Pack Awards are the showcase for the South African packaging industry. From inception in 1973, it has grown into an event of considerable importance and prestige. The competition for medals is fierce, however the awards event is a warm celebration for everyone involved or interested in packaging. The 2017 awards are set to be no different.

JC Le Roux Promotional Pack by Printafoil, winner of the Gold Medal for "Best in Paper or Board" in 2015.

Entries now open

The entry procedure is all done online with full guidelines and tips available on the website. The online entries close on 15 July 2017 and the pack samples need to be delivered by 31 July 2017. Anyone involved with the creation of a pack may enter, however in all cases the converter and the brand owner must authorise the entry indicating their consent and confirmation of all the details submitted. The packaging entered must have been converted in any country in Africa and should have been in use or on sale prior to the closing date. Entries that have previously won any IPSA GOLD PACK Award are not eligible. In all categories the local input will dominate the judges' decisions.

Medals

A gold, silver and bronze medal will be awarded in each of the categories, which are aligned to the product categories used in the international World Packaging Organisations (WPO) WorldStar Awards. All finalists and medal winners will be eligible to enter their pack in the international WPO WorldStars.

A relatively new category called 'Packaging Related' includes components, materials, machinery, processes, supplies and even point-of-sale displays. In this category the entry must be in use or installed in any country in Africa.

The Star of Africa

Another new category is the 'Star of Africa'. The gold medal in this category will be awarded to, in the judges' opinion, the best packaging entered that is produced outside of South Africa but in Africa.

The awards ceremony and party will be a glittering 'black-tie' affair at the Inanda Club in Sandton on 22 November. All details are available on www.GoldPack.org.za.

Mondi optimises containerboard portfolio

The modernisation projects at Mondi Swiecie mill reflect the Group's effort to innovate its product portfolio alongside its customers, keeping them 'one step ahead' in a 'very fast-moving consumer market that constantly challenges corrugated packaging solutions'.

Describing the enhanced containerboard portfolio, Maciej Kunda, managing director of Mondi Świecie, says, "We are now able to offer lightweight ProVantage Kraftliner, the high-strength semi-chemical fluting grades ProVantage Fluting Aqua and Fresco, which both match premier European quality standards, as well as increased output of ProVantage KraftTop Liner. The Świecie mill in Poland supplies the market directly from the heart of Europe."

ProVantage KraftTop Liners set to strengthen customer business

The ultimate test of any packaging material is its performance. Mondi's comprehensive range of strong ProVantage KraftTop Liner papers not only meet the criteria of attractive appearance and renewable materials, but also accommodate an abundance of applications, including sensitive goods, and heavy duty and industrial packaging.

The two-ply grade's top layer consist of 100% virgin fibre; the bottom layer contains some recycled fibre, thus merging the characteristics of virgin papers and recycled liners. These KraftTop Liner papers have a natural appearance, offer better technical parameters than fully recycled liners, and represent a compelling and low-cost alternative to conventional kraftliners.

"The packaging remains intact while protecting the contents and enhancing their appeal, even in the most challenging conditions. The international furniture company IKEA uses our grades in transport packaging, for instance, to make sure that its products arrive at the store or customer's home intact," comments Florian Stockert, sales director Containerboard, Mondi Europe & International.

ProVantage KraftTop Liner X now produced by ECO7

In 2016 Mondi began producing ProVantage KraftTop Liner X on the high-end ECO7 machine at Świecie. The modernisation has enabled it to process virgin fibres for the first time. Alongside the new grade, ECO7 still offers the lightweight recycled containerboard grades ProVantage Fluting WB and ProVantage Testliner3.

"The modernisation allows us to produce ProVantage KraftTop Liner X with a substance range of 100-135gsm on our ultra-modern paper machine ECO7, which entered service in 2009. In addition, we have extended the range of our recycled grades ProVantage Testliner3 and ProVantage Fluting WB to include a 160gsm variant," explains Stockert.

Lightweight packaging meets challenging conditions

Mondi's ProVantage Fluting Aqua and ProVantage Fluting Fresco grades now offer advanced quality to deliver substantial benefits to corrugated box producers, fruit and vegetable growers, retailers and end-users:

- Better strength and improved moisture profile for long-distance shipping from farm to shelf.
- Considerable raw material and transportation cost savings.
- Overall paper quality improvement from enhanced technical parameters.

On improved parameters and higher quality, Stockert remarks, "By increasing the Short-span Compression Test and Concora Medium Test values, achieving more stable profiles, and improving both the formation of flutings and the runnability on corrugators, this investment puts Mondi on a par with Nordic producers of semi chemical flutings and will contribute significantly to our customers' continuing success."

Next steps

Kunda adds, "The next major step towards finalising our optimised containerboard product portfolio at Świecie is marked by quality improvements to ProVantage Kraftliner. This grade is produced on PM1 and starts with a 100gsm variant. The enhancements include better formation, more consistent substance and a refined moisture profile. As a consequence, corrugators will benefit from our grade's better convertibility."

Stora Enso invests in microfibrillated cellulose in paperboard packaging

In January this year, Stora Enso announced investments in its consumer board mills in Imatra and Ingerois, Finland, and Fors, Sweden. The intention of these investments is to continue the commercialisation of microfibrillated cellulose (MFC) as well as accelerate product development.

Initially focused on the liquid packaging board segment, Stora Enso is the first company to have successfully launched a commercial paperboard packaging including MFC. Commercial activity started in 2015 at the Stora Enso Imatra plant, which is the world's largest MFC facility. Today, raw material is provided for selected commercial consumer board solutions, enabling lighter weight packaging while maintaining stiffness and internal strength.

In packaging, MFC brings advantages in source reduction, strength enhancement, lightweighting and renewable barrier materials. Due to its exceptionally high strength properties and 100% renewable raw materials, MFC is designed to outperform current fossil-based materials, such as plastics, in a variety of applications.

"There is a big pull in the market for fossil-free materials for the packaging industry. Plastics in the sea, global warming and mounting waste – these are all challenges and pressing consumer and industrial demand for better solutions. Additionally, major companies and brand owners have targets to reduce their environmental footprint. We are all on the same train here," says Jukka Kankkunen, who works with the MFC Commercialisation, Consumer Board.

Moving ahead, Stora Enso will continue to focus on source reduction and fibre-based packaging that consumes less raw materials. In parallel, we are exploring barrier layers for grease, mineral oil and oxygen, as well as biodegradable film as a replacement for aluminum in paperboard packaging. These have potential in markets such as fast food and long shelf-life products like jams, juice, sports drinks, candy and snacks.

"According to one of our customers, aluminum film carries as much as 50% of the CO_2 footprint of their primary packaging material. Imagine millions and millions of food and beverage products. Reducing the aluminium component could make a big difference," concludes Jukka.

Cortec creates high tech creped paper

Cortec's high-tech CorShield® Creped Paper powered by Nano-VpCI® combines corrosion protection and packaging into one step and eliminates package contamination. By providing thorough protection for both ferrous and non-ferrous metals, it eliminates the need for a variety of protective papers for different types of metals and alloys.

Apart from being fully recyclable/repulpable, the creped paper is safe, non-toxic, biodegradable, and doesn't contain any nitrites, phosphates, or silicates. It is made without the use of chlorine or other chemical bleaching.

There are no chemical concentrations to calculate, no chemical tanks, or application system to maintain. Products can be wrapped in the paper and edges folded together.

The VpCI® coating on the paper vaporises, reaching all metal surfaces to provide complete corrosion protection. The unique inhibiting action of the packaging forms a very thin and very effective protective layer that does not alter the appearance of products or require removal before further finishing or use. This protective layer will not influence physical properties of most sensitive electrical components, including conductivity and resistance. The product is effective against aggressive environments including humidity, SO_2, H_2S, and galvanic corrosion from dissimilar metals. Parts protected can be painted, welded, and soldered.

CorShield® Creped Paper can be used to protect products for storage and shipment in a variety of ways: single item packaging, interleaving, end closures for shipping tubes, insert strips for recessed areas in large packages, and as sheet liners or separators between products. It is particularly suitable for bearing industry as it offers cushioning, corrosion protection and 'pooling' effect for rust-preventative oils.

Photo: Mpact

SUPPLIER CASE STUDY

Ahead of the pack

in South African carton board manufacture

ORIGINAL TEXT BY VERITY ROSS

The face of packaging is changing as the traditional cartonboard market competes against an increase in the demand for plastic packaging, especially in sectors of the food industry. To stay abreast of these global trends and remain competitive, the way forward for Mpact Springs Mill was to improve operational efficiencies and product quality, reduce costs and increase output.

Metso was selected to partner with and assist the packaging manufacturer in reducing its overall operating costs, while improving quality and increasing throughput. The scope of supply for Metso was the selection and installation of Neles Valves.

According to Howard Emmett, mill manager for Mpact Springs, the demands of meeting their objectives were highly challenging as the mill has many complexities and works with recycled fibre to produce a world-class product.

The mill differentiates its products from competitors by producing high quality board with excellent surface properties. One of the advantages of this is that Mpact's customers are able to use multi-colour print on their product, thus creating a high definition for marketing and advertising on the packaging. Further benefits are the rigid properties, which accommodate aesthetic and excellent shelf packing. Food safety accreditation is achieved by applying protective coating barriers that meet international standards for dry food packaging as well as moist and fatty food packaging. Another significant factor is that 90% of the fibre used in the manufacturing process is from recycled fibre.

"Metso valves have helped with the optimisation of our production processes and lowered the entire manufacturing environmental footprint," says Emmett. "Water conservation, energy and waste reduction is where Metso's expertise became a vital component to improve the entire process."

Challenge accepted

In order to meet Mpact Springs Mill's Key Performance Indicators (KPIs) from an operational perspective, the mill had to consider control variability, equipment reliability, time and material efficiencies to achieve a higher level of total efficiency. Further down the line, the engineering department has KPIs regarding reliability, availability and sustainability of equipment.

About three years ago Mpact Springs Mill introduced an operational improvement programme 'The Way Forward'. "It is systematically structured to improve operational efficiency and thereby establish a sustainable and rewarding business for employees and shareholders. The sustainability of the mill will be determined by the success of this programme," comments Emmett.

"In order to set this up we had to consider all the dynamics of running a successful operation. We had to look at water, energy, safety, people development, cost management, business re-engineering, product development, investments and profitability etc. The programme - planned over a five-year period with all aspects considered - has been split into different disciplines with action lists developed for each discipline."

Operational targets have been established for the next three years and the disciplines include:

- Housekeeping
- Back to basics
- Electrical, instrumentation and automation
- Mechanical
- Board making
- Product development
- Production bottlenecks
- Investments
- Safety and risk action plan
- Resource the way forward
- People development

Over the last three years Mpact Springs Mill has made significant investments into capital projects. Almost 90% of the investment capital was spent on quality improvement, energy reduction, process stability and total cost improvement. "It was not necessarily capacity that Mpact Springs Mill was looking for, but due to the improved efficiencies and optimisation of the processes we did get capacity. We exceeded our quality improvement and energy efficiency targets at the same time, seeing a total cost reduction," says Emmett. "If you get the basics right, it takes you to the next level."

Mpact Springs Mill is a 24-hour operation, running seven days a week, and therefore unnecessary downtime is averted at every opportunity. The company is proud of its excellent working relationship between staff and management. They have a large internal employee development programme in place, plus they are committed to working with learners. The company also boasts an excellent safety and environmental record with all the relevant procedures in place and ISO certification.

Commitments delivered

According to regional sales manager at Metso Flow Control Douglas McCrum, Mpact Springs Mill has, over the last number of projects, standardised on Neles valves in their plant. "In the international arena, Neles is highly reputable in the pulp and paper industries and has become renowned for reliability and control performance. The most up-to-date technology available on the market is being used in our valve controller design.

"Taking these qualities into consideration has enabled us to assist Mpact Springs Mill to improve efficiencies and reduce any downtime or process variability that may occur due to valve failures. Our valve design is developed specifically for these applications," says McCrum.

If you get the basics right, it takes you to the next level.

HOWARD EMMETT
Mill Manager, Mpact Springs Mill

Challenges for Metso

- Aiming to solve stock preparation challenges
- Industry challenges in the region and at the mill: Due to increasing energy, fresh water and raw material costs, it was necessary for the mill to reduce costs relating to usage and fibre yield. The equipment had exceeded their intended useful life, resulting in increased maintenance costs and unplanned downtime.

The range of valves and intelligent valve controllers is designed to eliminate emissions and increase process efficiency and reliability in the pulp and paper production process. The company was chosen as the main supplier of valves for Mpact Springs Mill due to the backing of its global expertise.

"The dedication of our team getting to grips with what Mpact Springs Mill needed to achieve their goals went a very long way to Metso receiving the order. This went from considering the bottom line to setting up a dependable backup and support process during the project execution," says McCrum.

The company's proven track record of delivering engineered performance and reliability to the pulp and paper industry has made it the market leader in control and on-off valves globally. About 75% of the world's pulp flows through Metso's valves, which is an enormous portion of the market.

The extensive valve order for Mpact Springs Mill included a total of 370 ball, segment and butterfly valves for on-off and control applications from the Neles product portfolios. The control valves are equipped with Neles ND9000 series intelligent valve controllers, which have the capability for advanced performance and diagnostics.

Further results are a reduced spares holding capacity and an increased lifetime. "The feedback from our customer is very positive: the Metso team is capable, supportive, knowledgeable and dependable with their expertise," concludes McCrum.

A step-by-step guide for **testing control valve positioners**

Valves, the actuators that move them, and the electronic circuits that control them are all subject to aging soon after they are installed.

Valve seats become worn from repeated seatings and from the liquid or gas that passes through them. A valve may be stroked up to tens of thousands of times a year, which causes screws to reposition, springs to weaken and mechanical linkage to loosen. Electronic components change value over time. All of that can produce valves that don't fully open or close, or close prematurely. This "calibration drift" can result in improper regulation of the gas or liquid under the valve's control.

To keep valves operating properly, one needs to periodically check electronic valve positioners. However, these checks need to be conducted quickly to minimise down time. If calibration drift is found, the valve positioner must also be recalibrated immediately.

A good tool for this is a handheld field tester such as the Fluke 789 ProcessMeter that can be used to test and recalibrate electronic valve positioners. It offers signal sourcing to simulate a controller connected to a valve positioner's input and can continuously adjust the source current in incremental steps, so you can check the valve's linearity and response time.

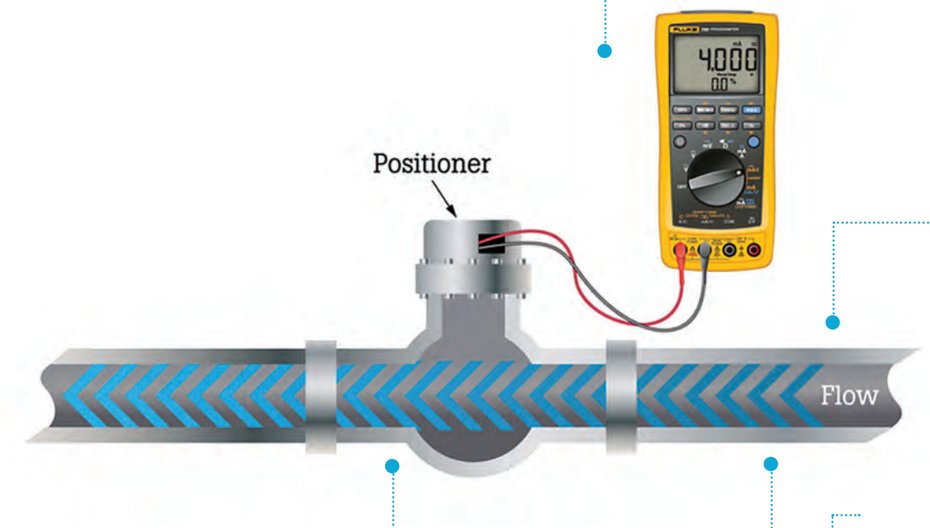
Here are the basic steps for checking a normally closed valve using a 789 ProcessMeter.

1 Set up the ProcessMeter in sourcing mode using the appropriate range of current for the positioner.

2 Insert the source current test leads into the mA output jacks.

3 Select the 4-20mA range by moving the function switch from Off to the first mA output position.

4 Connect the meter mA output to the input terminals of the valve positioner.



5 To determine if the positioner is fully closes the valve at 4mA, adjust the source current to 4.0mA using the push button. The valve should be closed.

6 While watching the valve for any movement, press the Coarse Down button once to decrease the current to 3.9mA. There should be no movement of the valve.

7 In setting the point at which the valve starts to open, make sure there is no counter pressure by the actuator against the force holding the valve closed when there is 4.0mA on the controller's input. In a spring-to-close valve, there should be no pressure on the diaphragm. With a double acting piston actuator, there should be no pressure on one side of the piston. To ensure that there is no counter pressure at the closed setting, you may want to set the start of opening between 4.1 and 4mA.

8 To check the opening of the valve, press the Coarse Range Up button from 4.0mA. Each press of the Coarse Range Up button will increase the current 0.1mA. You should adjust the zero adjustment on the positioner to set the valve for the closing characteristic desired.

9 To check the valve at the fully open position – called a span position check – adjust the source current to 20mA using the range buttons and allow the valve to stabilize. While watching or feeling for valve movement, press the Coarse Range Up button once to 20.1mA. The valve movement should be as small as possible and can be adjusted using the span adjustment on the positioner.

10 Using the coarse control, adjust current up and down between 20.1mA and 19.9mA. There should be no movement of the valve stem from 20.1 to 20mA and slight movement from 20mA and 19.9mA.

11 In most valves, there is an interaction between the zero and span settings of a valve controller, so it is best to ensure proper valve position adjustment by repeating the test of the fully closed and fully open positions until no further adjustment is necessary.

12 For valves with linear action, linearity can be checked by settings the ProcessMeter to 4mA and using the % Step button to step the current to 12mA (50%) and confirm the valve position indicator is at 50% travel. If your valve is a non-linear type, refer to the valve manual for proper operation.

13 To check for smooth valve operation, turn the rotary switch to output mA and select Slow Linear Ramp. Let the meter ramp the mA signal through several cycles while you watch or feel for any abnormal operation of the valve. The valve should NOT oscillate or hunt at any of the step positions of the Slow Ramp. The valve also should not be sluggish. Set the gain of the valve controller to a point that gives the best response between these two conditions.

Pulp and paper mill sludge

A potential resource for producing high-value products

PRABASHNI LEKHA[1], JEROME ANDREW[1], MAGDI GIBRIL[2] AND BRUCE SITHOLE[1,2]

Abstract

Pulp and paper mill sludge, the residual product after waste-water treatment, contains valuable material that can be converted to high-value products. Currently, mills in South Africa are primarily landfilling or incinerating the sludge, which is a waste of a valuable resource. In addition, these disposal methods are accompanied by many environmental hazards such as emission of greenhouse gases into the atmosphere and the leaching of toxic substances into surrounding ground and water systems. The implementation of environmental policies (e.g. National Environmental Management Act (NEMA) and supporting Air Quality Act and Waste Act), as well as impending carbon taxes, warrants better management of sludge since the current methods may not be viable options in the future. A summary of sludge beneficiation opportunities have been captured to highlight some of the pathways that show potential for South African mill sludge valorisation and possible diversion from landfill.

Keywords: beneficiation, sludge

1. Introduction

The residual solid product of the waste-water treatment plants at pulp and paper mills is termed sludge. Sludge is comprised of residual chemicals, fibres, sand and grit from the processing of wood, and in some instances recycled materials, to produce pulp, paper and tissue products. The disposal of sludge is a huge problem facing modern industry since the current modes of disposal such as landfill and incineration are accompanied by many environmental hazards. These include emission of greenhouse gases (GHG) into the atmosphere and the leeching of toxic substances into surrounding ground and water systems. Incinerating the sludge results in the emission of gaseous NOx and SO2, which are the major precursors of acid rain (Bajpai, 2015). The residual ash after incineration also contains various toxic metals, which need to be landfilled and hence result in ground water contamination (Bajpai, 2015).

The urgency to establish alternatives to the present disposal methods of waste streams is because of the various pieces of legislation presently being implemented (e.g., National Environmental Management Act (NEMA) and supporting Air Quality Act and Waste Act) (Nhamo *et al*., 2014). The act has implications for emissions, particularly for the reporting of industrial GHG emissions data. In addition, the South African government is developing a legislation plan to achieve a reduction of GHG emissions that involves a target of 34% below the business-as-usual baseline by 2020 (Wolpe and Reddy, 2015). There are also plans to initiate a carbon tax policy which proposes a tax on the emission of carbon dioxide (CO_2) into the atmosphere. "The policy will set a tax rate of R120 per tonne of CO_2 emitted, above the basic tax free threshold of 60%,"(Mahomed, 2013). According to Buswell and Mueller (1952), 1 tonne of low-ash pulp mill sludge in landfill theoretically releases into the environment approximately 2.69 tonnes of CO_2 and 0.24 tonnes of methane.

Implementation of ways to divert sludge from landfill can have positive economic and ecological impacts for small, medium and large mill operations. Small to medium operating mills presently incur transport costs as well as gate fees at landfill sites for sludge disposal, while larger mills that have acquired land for landfill incur huge capex investment costs for maintenance of existing landfill sites and building of new landfill sites. By diverting sludge from landfill, these costs will be minimised and the mills can gain an additional revenue stream from the sale of the products produced from the sludge. If the sludge is used for energy, the mill can become energy-sufficient and minimise utility costs. Ecologically, the mills will reduce their carbon footprint by reducing GHG emissions and become compliant with environmental legislation. A summary of beneficiation opportunities have been captured to highlight some of the pathways that show potential for mill sludge valorisation in SA.

2. Potential pathways for sludge beneficiation

Pulp and paper mill sludge contain valuable fibres that can be used in products different to those traditionally produced by the pulp and paper industry. Schematic 1 shows the potential beneficiation pathways that may be applicable to mills in South Africa. These options are based on literature findings where promising preliminary data have been obtained from laboratory experiments.

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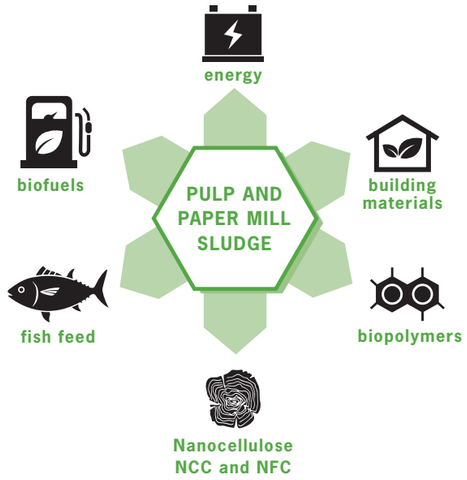
SCHEMATIC 1: Potential beneficiation options for mill sludge produced in South Africa



3.1 Energy

South Africa currently relies heavily on large-scale coal-fired power stations for its energy demand, which has been proven to be unsustainable (Petrie, 2014). Pulp and paper mill sludge contain significant amounts of wood fibres that can be converted into renewable energy. There are different mechanisms that can be used to produce energy from organic residues, some routes have been summarised in Table 1. Deviatkin *et al*. (2015) review on utilising de-inking sludge for energy indicated that incineration is economically unsustainable because of the low calorific value of deinking sludge; however, pyrolysis could be an option. Ridout *et al.* (2015) also showed that fast pyrolysis on low and high ash containing sludge types could be an option for sludge valorisation. Anaerobic digestion, although still requiring research and development to reduce residency time in large fermenters has also been highlighted as having potential for converting sludge into energy (Faubert *et al.*, 2016). Pulp and paper mills can reduce their operation costs by using sludge as a renewable energy source whilst reducing their carbon footprint.

3.2 Biofuels

Bioethanol production from mill sludge presents a feasible option for sludge valorisation by contributing to sustainable clean energy generation (Van Zyl and Görgens, 2014). During the paper making process, the crystalline region of the cellulose fibres become disrupted which facilitates enzyme hydrolysis during fermentation for ethanol production, thus sludge fibres have an advantage over other lignocellulose feedstocks e.g., woody or grassy biomass. The latter fibre options usually require harsh and energy intensive pre-treatment processes to disrupt the crystalline regions for enzymatic hydrolysis, which usually adds to the cost of bioethanol production (Kang *et al.*, 2010, Boshoff *et al.*, 2016). Using a fed-batch simultaneous saccharification and fermentation process, Boshoff *et al.* (2016) showed that bioethanol production from corrugated recycled fibre sludge is promising which produced an ethanol concentration of 45.5 g/l. Sludge produced primarily from virgin fibre showed high water holding capacity thus reduced solid loading and inevitably resulted in low ethanol yield.

3.3 Biopolymers

The production of lactic acid which can be converted into its polymer form, Poly Lactic Acid (PLA), has emerged as one of the most popular bio-degradable plastics available on the market. Poly lactic acid finds major applications in the food packaging industry, especially in frozen foods, ready-to-eat meals, and cutlery. Traditionally, PLA is produced from corn or potato starches. However, cellulose and hemicelluloses recovered from pulp and paper mill waste streams and other sources such as forestry biomass can be potential feedstock for the production of PLA. The global demand for lactic acid is increasing due to the new applications of L(+) lactic acid as a monomer in biodegradable plastics or as an intermediate

TABLE 1: Brief summary of some technology options for converting mill sludge into renewable energy.

TECHNOLOGY	TECHNOLOGY DESCRIPTION	ADVANTAGES	DISADVANTAGES
Combustion	Burning of sludge residue in boiler	Reduction in volume of waste for landfill	• Process can be energy deficient • Release of toxic air emissions – environmentally unfriendly • Residual ash that requires disposal
Pyrolysis	Heating of organic waste in the absence of oxygen to produce a mixture of gaseous and liquid fuels, with a solid inert residue (biochar)	• Non-burning process • Minimisation of air pollution (captures volatiles) • Conversion of all sludge residue into useful products	Requires low moisture content of sludge (<20%) for liquid fuel recovery
Gasification	A thermal process converting a combustible material into an inflammable gas and an inert residue using air or oxygen	• Reduced environmental emissions • High efficiency of energy recovery	Complex technology – sludge properties driving efficiency not well understood
Anaerobic digestion	Anaerobic digestion is a biological process whereby bacteria break down organic matter in oxygen-free environments	• Reduced environmental emissions • Conversion of all sludge residue into useful products – gas and compost	Long residency time in digesters but new pre-treatment strategies can reduce residency time

in the synthesis of high-volume oxygenated chemicals. There is no production of lactic acid in South Africa. The use of PLA to produce bio-based plastics present a huge potential to reduce our dependence on fossil fuels and the related impacts that the traditional crude-oil based products have on the environment. The conversion of mill sludge into lactic acid has been extensively studied (Marques *et al*., 2008, Lee *et al*., 2004, Budhavaram and Fan, 2009). High yields of lactic have been obtained using simultaneous saccharification and fermentation processes.

3.4 Nanocellulose

The global market for nanocellulose technologies is projected to reach US$ 530 million by 2021, driven by expanding applications and the growing focus on green alternatives to petroleum in the manufacture of synthetic polymers and chemicals (Global Industry Analysts, 2015). The production of nanocellulose from sludge is viable as the sludge is already partially bleached, hence it will possess less lignin, hemicellulose and other low molecular weight components making it easier to isolate the pure cellulose (Leão *et al*., 2012). A few studies have shown that the properties of nanocellulose particles produced from sludge are comparable with nanocellulose produced from other feedstocks (Shoseyov *et al.*, 2011, Leão *et al*., 2012, Sehaqui *et al.*, 2016, Jonoobi *et al.*, 2012). These nano-scale products offer promising opportunities for applications in composite materials which may be used in several applications, such as construction, automotive, medical and environmental.

3.5 Fish feed

The aquaculture industry in South Africa is growing - in 2013 SA exported 100 million kilograms of fish and aquatic invertebrates yielding an export value of R3.96 billion (Mogala, 2014). Fishmeal currently produced from wild fish is the main source of protein in fish feed for the aquaculture industry (Alriksson *et al.*, 2014). The production of fishmeal is not sustainable and due to the incline in the aquaculture industry, the price of fishmeal has also increased. The increased demand of fishmeal for fish feed production and the high price have caused a need for alternative protein sources. Single cell protein (SCP) has been identified as an interesting source of alternative protein that has comparable nutritive values to fishmeal. SCP consists of microorganisms such as yeast, bacteria, algae and filamentous fungi. A recent study by Alriksson *et al*. (2014) has shown the successful conversion of forestry waste streams into SCP. The fibres from mill sludge can be converted to a glucose rich hydrolysate for the production of SCP, thus offering an attractive concept of turning forest waste material into a protein-rich component in fish feed.

3.6 Building materials

The use of mill sludge in the production of building/construction materials has been extensively studied in recent years (Cernec *et al.*, 2005, Johnson *et al.,* 2014, Cusidó *et al*., 2015). Products that have been considered include: bricks and blocks, concrete mixtures, ceramics, cement-like material and light weight aggregates. Sludge types that have high inorganic fractions are suggested to be better for building materials (Cernec *et al.*, 2005). Studies have shown that products produced from mill sludge are comparable in properties (e.g. strength) to conventional products (Johnson *et al*., 2014, Cusidó *et al*., 2015). Based on all the mineral product case studies, bricks proved to be the most profitable for both the paper industry and the brickworks (Kujala, 2012).

4. Conclusion

There has been a significant amount of research performed to valorise pulp and paper mill sludge waste. However, most of the technologies to date require more research and development as well as feasibility studies to take the work to pilot or industrial scale. The options identified to valorise sludge waste in South Africa include: energy production via pyrolysis or anaerobic digestion; bioethanol via fed batch SSF; biopolymers e.g. PLA and/or PHAs using fermentation, building materials e.g. cement and bricks; and nanocellulose production e.g. CNC or CNF.

The composition of the sludge differs based on the mill operation as well as the feedstock (virgin fibre or recycled fibre) being processed, therefore making it difficult to provide one solution for all the different types of mills. However, based on the characteristics of each mill sludge, we anticipate being able to guide industry as to which beneficiation option will be most suited to the mill operation after conducting a techno-economic feasibility study. Factors such as the amounts of sludge produced, sludge uniformity and the technology options available all need to be considered.

Some of the major hurdles experienced when processing sludge include: dewatering the sludge because of the high water content for certain applications, fractionating the sludge to produce pure feedstocks for new processes and transporting the sludge to the site of use. The CSIR's Forestry and Forest (FFP) Research Centre is currently undertaking an extensive characterisation study of mill sludge from mills that use different fibre feedstocks and processing methods.

5. References

Alriksson, B., Hörnberg, A., Gudnason, A.E., Knobloch, S., Arnason, J. and Johannsson, R. 2014. *Fish feed from wood*. Cellulose Chemistry and Technology, In press.

Global Industry Analysts. 2015. MCP-7961: *Nanocellulose technology – a global strategic business report.* Access online: Http://Www.Strategyr.Com/Pressmcp-7961.Asp.

Bajpai, P. 2015. *Management of pulp and paper mill waste*, Springer.

Boshoff, S., Gottumukkala, L.D., Van Rensburg, E. and Görgens, J. 2016. Paper sludge (PS) to bioethanol: Evaluation of virgin and recycle mill sludge for low enzyme, high-solids fermentation. *Bioresource Technology*, 203, 103-111.

Budhavaram, N.K. and Fan, Z. 2009. Production of lactic acid from paper sludge using acid-tolerant, thermophilic Bacillus coagulan strains. *Bioresource technology*, 100, 5966-5972.

Buswell, A. and Mueller, H. 1952. Mechanism of methane fermentation. *Industrial & Engineering Chemistry*, 44, 550-552.

Cernec, F., Zule, J., Moze, A. and Ivanuš, A. 2005. Chemical and microbiological stability of waste sludge from paper industry intended for brick production. *Waste management & research*, 23, 106-112.

Cusidó, J., Cremades, L., Soriano, C. and Devant, M. 2015. Incorporation of paper sludge in clay brick formulation: Ten years of industrial experience. *Applied Clay Science*, 108, 191-198.

Deviatkin, I., Kujala, A. and Horttanainen, M. 2015. *Deinking sludge utilization possibilities: technical, economic, and environmental assessments.* LUT Scientific and Expertise Publications/Research Reports.

Faubert, P., Barnabé, S., Bouchard, S., Côté, R. and Villeneuve, C. 2016. Pulp and paper mill sludge management practices: What are the challenges to assess the impacts on greenhouse gas emissions? *Resources, Conservation and Recycling*, 108, 107-133.

Johnson, O., Napiah, M. and Kamaruddin, I. 2014. Potential uses of waste sludge in construction industry: a review. *Research Journal of Applied Sciences, Engineering and Technology,* 8, 565-570.

Jonoobi, M., Mathew, A.P. and Oksman, K. 2012. Producing low-cost cellulose nanofiber from sludge as new source of raw materials. *Industrial Crops and Products*, 40, 232-238.

Kang, L., Wang, W. and Lee, Y.Y. 2010. Bioconversion of kraft paper mill sludges to ethanol by SSF and SSCF. A*pplied Biochemistry and Biotechnology*, 161, 53-66.

Kujala, A. 2012. P*apermaking sludges and possibilities of utilization as material.* Lappeenranta University of Technology, Bachelor Seminar of Environmental Technology.

Leão, A.L., Cherian, B.M., De Souza, S.F., Sain, M., Narine, S., Caldeira, M.S. and Toledo, M.a.S. 2012. Use of primary sludge from pulp and paper mills for nanocomposites. *Molecular Crystals and Liquid Crystals*, 556, 254-263.

Lee, S.-M., Koo, Y.-M. and Lin, J. 2004. *Production of lactic acid from paper sludge by simultaneous saccharification and fermentation.* Biomanufacturing. Springer.

Mahomed, F. 2013. *South Africa's carbon tax law to be introduced in 2015.* Accessed online: http://www.cnbcafrica.com/news/southernafrica/2013/07/03/safrica%E2%80%99s-carbon-tax-law-to-be-introduced-in-2015/.

Marques, S., Santos, J.A., Gírio, F.M. and Roseiro, J.C. 2008. Lactic acid production from recycled paper sludge by simultaneous sacharification and fermentation. *Biochemical Engineering Journal*, 41, 210-216.

Mogala, M. 2014. *A profile of the South African aquaculture market value chain.* Accessed online: http://www.nda.agric.za/doaDev/sideMenu/Marketing/Annual%20Publications/Commodity%20Profiles/Livestock/Aquaculture%20market%20value%20chain%20%20profile%202014.pdf.

Nhamo, G., Pophiwa, P. and Tshangela, T. 2014. *Mapping the green economy landscape in South Africa.* Breakthrough: Corporate South Africa in a Green Economy Africa Institute of South Africa. G. Nhamo ed, 23-55.

Petrie, B. 2014. *South Africa: A case for biomass*. IIED, London.

Ridout, A.J., Carrier, M. and Görgens, J. 2015. Fast pyrolysis of low and high ash paper waste sludge: Influence of reactor temperature and pellet size. *Journal of Analytical and Applied Pyrolysis*, 111, 64-75.

Sehaqui, H., Mautner, A., De Larraya, U.P., Pfenninger, N., Tingaut, P. and Zimmermann, T. 2016. Cationic cellulose nanofibers from waste pulp residues and their nitrate, fluoride, sulphate and phosphate adsorption properties. *Carbohydrate polymers*, 135, 334-340.

Shoseyov, O., Heyman, A., Lapidot, S., Meirovitch, S., Nevo, Y. and Rivkin, A. 2011. *Method for production of cellulose nano crystals from cellulose-containing waste material.* Google Patents.

Van Zyl, W.H. and Görgens, J.F. 2014. *Production of biofuels from cellulosic industrial waste streams.* Presented at the Industry-meets-Science workshop held at the University of KwaZulu-Natal in November 2014. Accessed online: http://www.wasteroadmap.co.za/download/ims2014_present15.pdf

Wolpe, P.and Reddy, Y. 2015. The contribution of low-carbon cities to South Africa's greenhouse gas emissions reduction goals. *Stockholm Environment Institute*, 1 -32.

SPEED MEASUREMENT

Getting your paper machine up to the right speed with the right measurement

Speed measurements on paper machines are essential to get the root of increased fabric wear or sheet breaks. Heimbach's TASK – Technical Assistance, Service and Know-How – department assists the company's customers in numerous ways. Whether they are investigating one or, in some cases, all sections of a paper machine, offering advice on machine technology or performing analyses, no two jobs are alike.

What TASK does know for sure, however, is that on many occasions a customer firstly needs the facts to pursue a line of enquiry. And TASK is able to help with specific measurement technology.

In this particular case a customer had ordered the complete clothing package from Heimbach and had requested TASK to check the jet-wire speed. The TASK team was in action during the start-up phase of a machine producing folding boxboard and carried out measurements on three headboxes in order to assess the jet-wire ratio.

Measurements are complex

There are often jobs in which speed measurement results helped to determine the cause of increased fabric wear and/or disproportionately increased sheet breaks. Other jobs consist of precision-tuning drive systems or synchronising transfer positions. In addition to this, TASK frequently checks machine settings, such as speed indicators, for accuracy – and this was also relevant for this particular assignment.

Facts for forming

Once on site, the Heimbach engineers exchanged views with the production manager who suspected that the three fabrics were not running at exactly the same speed, which could lead to displacement or movement of the sheet layers during couching. Furthermore it wasn't at all clear whether jet speeds were displayed correctly in the control room, which for machine operators in the forming section is the control instrument per se – after all, they rely on correct data in the control room to make the necessary adjustments at the machine.

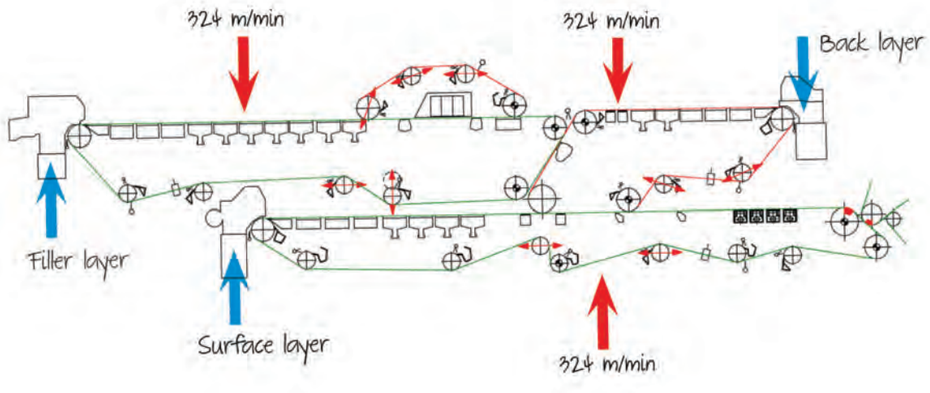
Perfectly calibrated and correctly displayed jet speeds – or 'jet-wire ratio' - are the basis for being able to manipulate the formation and some of the stability characteristics of the end product.

First results

The measurements began and the jet speeds as well as those of the forming fabrics of the filler, back, and surface layers were identified.

The first significant result was that all three fabrics were running at exactly the same speed (see Fig.1), so that TASK was able to quickly reassure the production manager with regard to his first concern. The speed displayed in the control room also corresponded to the result of the measurements. However, in the back layer a major difference of jet speed was discovered: The measured speed was around 35m/min below the value that was shown in the control room. It was suspected that the problem might be down to a calculation error and/or incorrect programming of the speed indicator.

FIGURE 1 Fabric speed in the filler as well as surface and back layers.



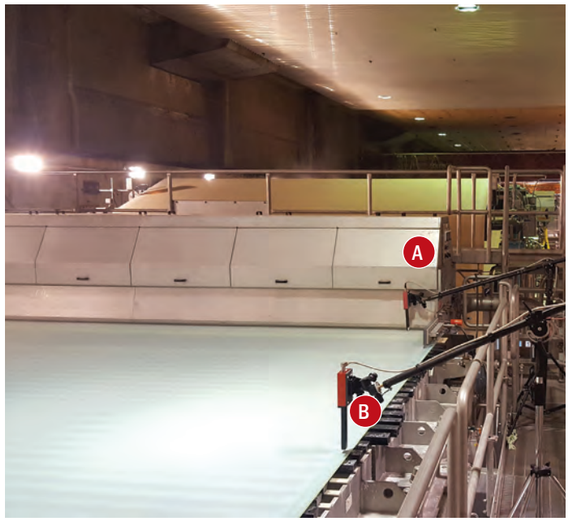


FIGURE 2 Both fixed measuring points in the filler position: A - Jet speed (back layer); B - Fabric speed (back layer).

Ratio - the decisive factor

Next, together with the paper makers on site, Heimbach dealt with the speed differentials between jet and fabric, i.e. the 'ratio'. You can appreciate how fundamentally important the provision of the correct value is in this context as fibre orientation and formation are set to these values.

Even though the back layer appeared to have a ratio of 10m/min, the measurements that were taken showed -25m/min (Fig. 2). In this circumstance, the paper makers quite logically assumed that the jet was 10m/min faster than the fabric and therefore more fibres were aligned in a cross direction. In fact, the jet was actually 25m/min slower than the fabric and therefore the fibre orientation followed tended more to the machine direction. TASK therefore increased the jet speed until a real ratio of zero metres per minute was achieved.

Slice opening and jet speed

After this had been accomplished the slice opening of the headbox was changed in order to find out whether the jet speed remained constant. For this test it is essential that all control parameters - including the adjusted ratio - are maintained.

If then only the slice opening of the headbox is changed (flow rate higher or lower), the jet speed has to remain constant. Any changes, however, are an indication that in principle the entire system has to be checked.

In the back layer something quite conclusive was found: When the slice opening was changed from 20.6 to 21.2mm, the jet speed was perfectly constant – however, measuring values and display consistently indicated a difference of just under 35m/min. Therefore it was concluded that there was really only one single factor responsible for the different readings.

Clarity achieved

The next series of measurements was performed in the filler position. This is a crucial factor for achieving overall sheet strength and comprises more than 80% of the total sheet mass. The jet was permanently 28m/min slower than displayed.

From experience the customer's operators had suspected from the beginning that the display was incorrect. Together with the customer, the speeds were aligned (jet and fabric). After completion of the adjustments the measured speeds matched. Finally the measurements in the surface layer (Fig. 3) were performed. The results of both the filler and the surface layer confirmed what had already been found in the back layer: only one single source of error made sense!

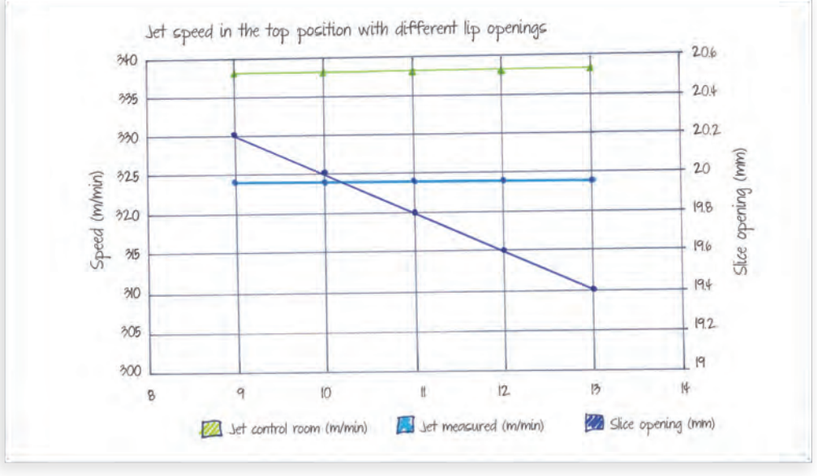
Job done – Customers satisfied

Now it was possible to tell the customer with absolute certainty: fabric and jet were perfectly adjusted in all three layers, which meant that trouble shooting could be focused on the area of data processing.

Either the software itself or its specific programming was the source of the problem.

From this point onwards the collected measurement results can provide the customer's software experts with the basis for correcting the calculation of the jet speed. Once this has been done, TASK will make another visit to the customer to test the jet speeds once more.

FIGURE 3 Measurement results in the top layer.



RENEWABLE ENERGY

No wasting energy on the horizon

In a first for the African continent, Clean Energy Africa Investments (CEA) has collaborated with the Industrial Development Corporation (IDC), Waste-Mart and Afrox to develop, build and operate New Horizons Energy, a waste-to-energy plant in Athlone, Cape Town. The facility – backed by a R400 million investment - was opened in January following five years of development.

Once complete, the plant will process average of 500 tonnes per day of municipal solid waste (MSW), wet trade waste (WTW) and pure organic waste (POW) to produce liquid Bio CO_2, Compressed Biomethane, also referred to as renewable natural gas (RNG), as well as organic fertiliser and refuse derived fuel (RDF).

Financed by the IDC in conjunction with CEA, this facility makes use of anaerobic digestion. This process involves the natural biological breakdown of biodegradable waste products to produce biomethane, RNG and CO_2 in the absence of oxygen.

“This project is a first of its kind for Africa and it will provide an effective waste management service and a valuable energy resource that will address Cape Town’s gas shortages,” said Egmont Ottermann, CEO of New Horizons Energy.

The New Horizons WtE plant aims to generate approximately 20 tonnes of renewable CO_2 and 600 GJ (gigajoules) of compressed biomethane, which is an average of 3 MW of electrical energy if converted. Once fully operational, the facility expects to divert up to 90% of the received waste away from landfills.

Commenting on the procurement of local SMEs, Ottermann confirmed, “We used as much local technology and contractor supply as possible. The main parts of the biogas, upgrading and recycling plant came from the Netherlands, Italy and Germany.” The facility expects to employ about 80 locals when fully operational.

Waste-Mart, a family-founded waste management company and waste disposal specialist in Cape Town, will provide feed stock for the plant while Afrox and New Horizons Energy have signed a 15-year commercial off-take agreement for the biomethane and CO_2.

With regard to other by-products, the organic fertiliser component can be used to supplement chemical and phosphate-based fertilisers. Ottermann adds, “RNG is used as a direct substitute for other fuels such as LPG and diesel. RDF is a high calorific value mix of combustibles that can offset coal and be converted into other value added products such as heat, electricity and fuel oil.” In dealing with the recovery of recyclables, a materials recycling facility is stationed on site, with mechanical and manual separation.

“This facility is proof that with great partners and hard work we really can change the way in which we generate energy. This plant will be the crown jewel for the City of Cape Town’s green ambitions, making it the first city to embrace waste to energy, and support the largest bio-gas facility on the African continent,” said Marcel Steinberg, founder and CEO of Clean Energy Africa Investments.

Some of the challenges experienced during construction included the high winds hampering offloading operations in Cape Town harbour, as well as excess sand on site.

The company foresees a number of opportunities to work with the pulp and paper sector and is currently involved with three projects in the waste wood and paper industry. “We are working closely with Sappi on the final EPC selection for a 10MW project in Mpumalanga,” concludes Ottermann.

TOP LET The partners who made the plant possible, from left, are Nazier Marthinus, CEO: Waste Mart; Sylvia Schollenberger, Head Commercial Projects: Afrox; Egmont Ottermann, CEO: New Horizons Energy; Marcel Steinberg, CEO: Clean Energy Africa; and Heinrich Uytenbogaardt, Strategic Marketing Manager, Bulk Markets: Afrox.

TOP RIGHT Patricia De Lille and Helen Zille cut the ribbon in Athlone, Cape Town.

RENEWABLE ENERGY

Nalco Water's FLOCMASTER® technology

delivers superior sustainability performance and major savings in operating costs at a paper mill in southern Europe

A de-inking paper mill located in southern Europe uses raw materials in its process that come directly from the local environment. As a result, management at the mill is always focused upon the use of sustainable production practices, including the optimisation of water resource use efficiency, minimisation of waste production, and the efficient use of energy. The mill has its own wastewater plant, including sludge dewatering equipment, and this was one specific area of focus for management in trying to identify new techniques and technologies to help achieve commitments around environmental performance, as well as to lower the Total Cost of Operation (TCO).

BACKGROUND

The mill specialises in the production of paper from recycled sources. Wastewater from the paper production process is treated in the wastewater plant. Excess sludge from the wastewater plant, from primary and secondary treatment, is dewatered in two parallel screw presses. Filtrate is sent back to the wastewater plant, and dewatered sludge together with paper residues from the process, are incinerated on-site.

Approximately 95,000 tonnes of dewatered sludge are incinerated each year. This composite waste is a precious source for the mill: the sludge/paper mix co-fuels the incinerator, along with natural gas, and the vapour generated is collected and recycled back to the process to dry the paper produced.

The dryness of the sludge is critical for the incineration process, since it directly impacts the caloric value of the material, and hence fuel usage and the cost-efficiency of incineration. The higher the residual water content in the sludge, the higher the heat requirements for combustion, increasing the demand for the more costly primary fuel needed to evaporate the residual water present.

The ability to achieve a higher dry solids content of the dewatered sludge was an important goal for the plant, since it offered the possibility to reduce fuel usage, greenhouse gas emissions, and overall costs.

CUSTOMER'S GOALS

Key Performance Indicators (KPIs) for the customer included:

- Safe, continuous and stable operation
- Continuous optimisation of water and energy resource use
- Reduction in the Total Cost of Operation without compromising operational practices and efficiency
- Improved sustainability and operational performance
- Outstanding supplier performance

Environmental Indicators	eROI	Economic Results
Use of FLOCMASTER technology for polymer makeup reduced fresh water demand by over 64,680m³ per year, conserving precious water resources in a water-stressed area	Water	Overall reduction in fresh water demand has reduced operating costs by over €1,000 per year, and safeguarded water supplies equivalent to the annual needs of over 1,100 people
Increasing dry solids by 6%, from 53% to 59%, in dewatered sludge reduced the volume for disposal by over 5,000 tonnes per year, and the demand for treatment consumables was reduced by over 70 tonnes per year	Earth	Reduction in treatment management costs of over €272,000 per year
Reduction in sludge volume for on-site incineration reduced fuel gas demand by over 330,000m³ per year	Air	Greenhouse gas emissions reduced by the equivalent of over 668,000 tonnes of CO_2 per year, with savings of over €122,000 per year in energy costs
Staff resources were able to be released for other duties, all data verified by the customer	Assets	Overall reduction in the TCO of over €396,000 per year

ACTION PLAN

Staff from Nalco Water were asked by management at the plant to conduct a thorough plant survey, and to assess opportunities to improve the operation of the sludge dewatering operation, and in particular the screw presses. As a result, Nalco Water proposed the use of its new FLOCMASTER technology. The proposal was accepted, and FLOCMASTER technology was installed on one of the two screw presses. The mixer was installed in-line with the sludge feed, and a polymer make-up system, which allows much higher solution strength than traditionally possible, was also installed. The polymer solution was made up at 1.20% as opposed to current practice of 0.16%. Both presses continued treating the same type and volume of sludge.

RESULTS

As a result of the introduction of the new FLOCMASTER technology on one of the two screw presses, the sludge dewatering programme was able to deliver greatly improved system performance, which included:

- Increased dewatered dry solids by 6% - from 53% to 59% - representing a reduction of 5,000 tonnes per year in sludge sent for incineration. Reductions in fuel demand were equivalent to 330,000m3 of natural gas per year, reducing greenhouse gas emissions by over 668,000 tonnes per year, and saving over €122,000 (R1,7 million) in annual energy costs (15%).
- Reduced fresh water demand used for polymer makedown by 64,680m³ per year (95%), equivalent to the annual needs of over 1,100 people, and reducing water costs by over €1,000 (R14,000) per year.
- Improved filtrate quality with a 36% reduction in suspended solids, and a reduction in polymer dilution water contribution to the wastewater, equating to an overall reduction in solids loading of approximately 298 tonnes per year.
- Improved treatment programme efficiency and usage, allowing a reduction in treatment consumables of 70 tonnes per year (64%), and delivering savings of over €272,000 (R3,8 million) per year.
- A 4% increase in the hydraulic capacity of the screw press treated as a result of the reduction in the volume of polymer added.
- Smoother operation of the press due to automation of polymer based on sludge flow, and an improvement in press performance. This allowed less human intervention, and manpower to be allocated elsewhere.
- Improved overall sustainability performance of the plant as a whole.
- Overall reduction in the Total Cost of Operation (TCO) of over €396,000 (R5,5 million) per year.

CONCLUSIONS

FLOCMASTER technology has demonstrated the value this new innovation can deliver to customers in the paper and other industries. A major increase in sustainability performance has been seen, and at the same time a major reduction in the TCO. The combination of the Nalco Water problem-solving approach, on-site expertise, and the application of new innovative technology, delivered improvements in performance and production continuity. The customer is now assured of the improved reliability of key strategic assets whilst optimising water use and energy, and reducing costs, and is examining the next steps towards implementing the programme on the remaining screw press.

A case for co-generation

In November 2016, the Department of Energy called a press briefing to announce the release of the new drafts of the Integrated Energy Plan (IEP) and Integrated Resource Plan (IRP).

Conspicuous by its absence was the inclusion of co-generation from the mix. This was particularly disappointing given the fact that the pulp and paper sector has come to the aid of the state during power shortages through the Short term Power Purchase Programme (STPPP). In 2015 they even agreed to a price cut.

Two weeks later, the Paper Manufacturers Association of South Africa (PAMSA) had the opportunity to raise its concerns around the new iterations of the IEP and IRP at public hearings held in Gauteng.

PAMSA challenged a number of the statements made in the two plans, and the presentation given at this public hearing is on the website at www.thepaperstory.co.za.

In respect of the 'draft IRP', PAMSA outlined the benefits that cogeneration could bring to the energy mix:

- There are energy efficiency gains through improvements in fuel conversion efficiency and use of waste resources and fuels. Compared to an Eskom boiler and generator which is typically 32% thermally efficient, the typical thermal efficiency of co-generation is 75%. The same ratios apply to water consumed, ash dumped and CO_2 emitted. This also equates to a fuel saving.
- Co-generation already has a connection into the grid. While some adjustments are needed, IPP can ride on the back of existing transmission and distribution infrastructure. This would result in a reduction in utility infrastructure investment due to decentralisation of energy production, as well as equipment.
- The power is often generated by the same industry consuming it, which ensures a reduced transmission and distribution losses, and the industry would be a 24/7 distributed generator.

In addition to the reductions in greenhouse gas emissions, there are opportunities for creating employment in the industrial sector. With more investment, comes more industrial activity. The happy consequence is an increase in jobs or at the very least a prevention of loss of employment. According to Jane Molony who handles much of the advocacy on energy issues on behalf of the paper manufacturing industry, National Energy Regulator of South Africa representative, Thembani Bukula, said when opening the public hearing, "We all want the same thing, stable affordable environmentally friendly power." PAMSA believes that co-generation offers exactly this.

By becoming more efficient in their use of energy, companies can reduce their electricity costs by up to 20% a year.

Your business is not as energy-efficient as you imagine

FRANCIS BARRAM
CEO, ENSIGHT

Photo: istockphoto.com

A decade after the power crisis of 2007 and 2008, and the subsequent steep electricity price increases, many large industrial groups in South Africa mistakenly believe that they have successfully transformed their businesses to reach optimal or high levels of energy efficiency. Yet this assumption is often incorrect - meaning that most large organisations are missing cost reduction opportunities worth millions or even hundreds of millions of rand each year.

The good news is that companies can unlock significant profits and productivity improvements by reducing wastage in their use of energy. According to the International Energy Agency, many companies are using up to 100% more energy than they would if they were best practice energy efficient businesses. **There are three key reasons that businesses buy into the myth of their own efficiency:**

1. They look at the wrong benchmarks. There is a pervasive myth that businesses will inevitably maximise efficiencies and profits, and that belief informs industry benchmarking as well as government statistics. Businesses look at the official statistics and at how their operations compare to industry averages, and believe that they are doing well. Rather than looking at the industry as a whole - which may not be as efficient as people imagine - they should be looking at opportunities to capture savings in their own businesses.

2. They look at energy as a fixed-cost rather than a variable cost. Many companies don't consider energy to be a variable cost that they can control. They believe energy is a fixed cost and, therefore, nothing can be done to reduce it.

3. They implement a single response to energy efficiency and believe that is enough. Energy inefficiency builds up by seemingly small things that are consistently repeated. It is a combination of multiple things that accumulate to result in inefficient systems. There is no once-off, grand plan that will end energy inefficiency—an appropriate approach would look at energy efficiency in each business process and system individually as well as in a holistic manner.

When we engage with mining companies we often find that they consider their businesses to be energy efficient after taking the obvious steps to reduce electricity consumption. They look at the performance of their peers and at fixed electricity prices and believe that they have done everything in their power to reduce their costs. Similar patterns are repeated across energy-intensive industries, including paper and pulp.

Yet when we look at the specific energy usage needs and patterns within their environments, we can usually identify a range of ways that they can drive down energy costs by 20% or more. For example, we worked with one copper miner that believed it had captured most of the possible energy savings in its business because it compared favourably to industry benchmarks. We uncovered additional cost savings of around 40% a year.

> “Lighting generates heat which contributes to the overall heat load of the building. This, in turn, affects the energy that the air-conditioning system uses to cool the building. Whether directly or indirectly, all systems that require energy are in some way or another interconnected.”

We had a similar experience at a titanium mining company and at a platinum mine, where we proposed annual cost reduction plans of 20% and 21% respectively. Because companies don't follow best practices for their own businesses, they miss out on significant cost-saving opportunities.

Energy efficiency unlocks profits

Given that energy accounts for between 15% and 30% of a paper and pulp company's total production costs, reducing energy use by 50% could dramatically increase earnings before interest and tax (EBIT). **Starting the journey towards becoming a more energy-efficient organisation starts with three insights:**

- Your energy systems are probably inefficient. Most businesses are running production systems designed 20-30 years back, when power costs were relatively low. It's not unusual to find old equipment in a process plant using water pressure four times higher than necessary to suppress dust, for example. This is a hidden liability and, as the costs of electricity rises, so will the cost to business.

- It's important to look at inefficiencies in each system as well as how various systems interact with each other. A simple example is how lighting generates heat which contributes to the overall heat load of the building. This, in turn, affects the energy that the air-conditioning system uses to cool the building. Whether directly or indirectly, all systems that require energy are in some way or another interconnected.

- Your systems are inefficient because you haven't defined your energy needs. Even in energy-intensive industries, many organisations have not clearly and comprehensively defined their energy needs. Without knowing what the energy the company buys will be used for or the physics of the energy needs, it is hard to understand the energy requirements of the total site (not just the plants that make up the site or the systems and equipment comprising the plant).

Engineers and designers in the past have simply assumed that all energy needs must be met with high grade energy; the systems, therefore, operate at greater capacity than is required. When energy needs are not clearly defined, systems are oversized and energy systems' operating parameters not are focused on efficiency, in turn creating massive waste. However, when energy needs are efficiently met massive cost savings are achieved.

It also important to think of energy efficiency as a long-term journey of optimisation. With energy costs constantly rising and new energy-efficient equipment and solutions coming to market each year, companies should constantly be evaluating whether there is more they can do to align themselves with the latest best practices.

There will be further price shocks in the electricity market in the next five years: since 2008, South Africa's electricity costs have soared by around 285% from an average of 19,6 cents per kilowatt-hour (c/kWh) to 75,4 c/kWh for 2015/6.

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The published data show that average pricing must rise in real terms over the next few years by more than 50%. Are you ready?

Assuming annual price increases averaging between 7.5% and 11% a year, we can project that the cost in c/kWh will double once again within the next five to seven years. Don't take the latest 2.2% NERSA electricity price increase as a sign of what the future holds. Additionally, the President and the Finance Minister have confirmed that the South African government will introduce carbon tax legislation this year to encourage organisations to reduce carbon emissions.

Most pulp and paper plants reuse biogas from their waste streams. However, this is not enough. The business is still heavily reliant on energy from the grid system, whether it is electricity or natural gas. The industry is exposing itself to huge future price shocks.

Executives can only immunise the business from government energy decisions by reducing reliance on the grid system—for example, eliminating energy waste, making the operation more energy efficient, and installing alternative sources of energy such as waste gas, solar or alternative fuels.

Insulating a business from energy wastage

Energy inefficiency is a hidden cost that eats away at a business' bottom line. Businesses that ignore this fact will pay the hefty price in years to come. But those that examine the impact of energy waste on the bottom line can start to drive the process towards best practice energy efficiency. It starts by acknowledging that waste exists. As they understand that energy use is not a fixed cost, organisations can find ways to reduce and manage this cost - in turn, boosting profits for the longer term.

THREE PART ABSTRACT

Deposit control in the pulp and paper industry

Novel developments with improved performance

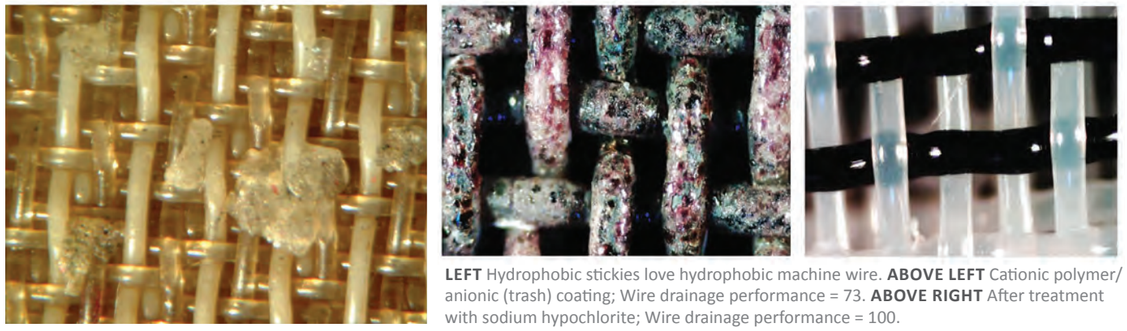
A full version of the paper will be published as a series in three issues of Paper Technology, *the official Journal of the Paper Industry Technical Association.*

With the ever-decreasing quality in the wastepaper supply chain, the control and suppression of hydrophobic contaminants, during the manufacture of recycled paper, is providing a formidable challenge. Without efficient treatment, hydrophobic pitch and stickie particles, in an aqueous environment, show a strong tendency to adhere to other hydrophobic surfaces, such as paper machine clothing and guide rolls. Once established, this contamination, which leads to sheet defects, web breaks and downtime on the machine, can only be removed with volatile organic solvents.

PART ONE

The first of this three part series discusses the various treatments, which are currently employed. In an attempt to minimise the degree of deposition, chemical suppliers have proposed a number of different products, for use either in stock preparation or as fabric conditioning chemicals.

Traditionally, fabric conditioning chemistry has been based on an aqueous blend of cationic polymers, with or without surfactants. There are several disadvantages to this technology, the most notable being the reduction in fabric porosity as the cationic polymers build layers of "coating" via the interaction of anionic trash in the backwater. Drainage through the fabrics is significantly reduced as the build-up of coating gradually reduces permeability.



LEFT Hydrophobic stickies love hydrophobic machine wire. **ABOVE LEFT** Cationic polymer/anionic (trash) coating; Wire drainage performance = 73. **ABOVE RIGHT** After treatment with sodium hypochlorite; Wire drainage performance = 100.

Colour and chemicals group Archroma has adopted a novel approach to fabric conditioning. Cartaspers PSM liquid is a biodegradable non-ionic alternative, comprised of both hydrophobic and hydrophilic components in its polymeric chain. The product has strong affinity for hydrophobic surfaces and, after adsorption on machine clothing, confers a high surface energy, which allows fabrics to be fully wetted. The thin surface layer of water acts as a barrier to pitch and stickie deposition. Unlike its cationic predecessors, Cartaspers PSM cannot build a coating layer, since it cannot adsorb on an already treated surface. Porosities are maintained, fabric life extended and, with less moisture to remove in the drying section, energy savings are significant. The use of volatile cleaning solvents has been practically eliminated. Various examples in commercial use are explained.

PART TWO

The second part in the series discusses the wet-end approach to deposit control. Over the years, many different theories and technologies have been postulated, as an answer to the prevention of pitch and stickie deposition. In reality, none has so far delivered sufficient cost-benefits to gain market acceptance.

The most popular procedures for deposit control in the wet-end of a paper machine fall mainly within three sub-categories, the first being the use of inorganic absorbents, such as talc, bentonite or diatomaceous earth. Secondly, there are a number of commercial products based on water-soluble nonionic or anionic polymers, designed to envelop the hydrophobic particles with a hydrophilic sheath and, lastly, the use of cationic coagulant polymers, which fix the pitch and stickie particles to the fibrous components and remove the contamination with the final sheet.

After several years of research, Archroma has developed a more innovative solution. Cartaspers SCH is an aqueous nano-dispersion of very hard synthetic-polymer particles. This patented technology utilises the presence of calcium ions (from the wastepaper) to destabilise the (now hydrophobic) nano-particles, which encourages adsorption on larger stickie particles. This freshly-created hard shell increases the softening point of the stickies, allowing the passivated contamination to retain its original particle size.

Often described by customers as a "liquid talc", Cartaspers SCH, and its sister product Cartaspers SCS, ensure that pitch and stickies are removed from the papermaking system, either with the final sheet or with the sludge from a DAF unit. In the absence of stickie agglomerates, the whole machine system runs cleaner, reducing the requirement for volatile solvents.

PART THREE

Not surprisingly, most of the effort assigned to deposit control management has focused on overcoming the contamination problems, associated with the use of wastepaper. But we cannot ignore the detrimental impact of pitch particles, which enter the papermaking process from virgin or high-yield pulps. Pitch constitutes less than 0.2% of virgin fibre but, due to its colloidal nature, generates millions of potentially tacky particles per kilo of pulp.

Surface tension in the paper machine water circuits plays an influential role in the assessment of potential deposition. In soft water locations, where conductivities are low, the surface tension approaches that of pure water (> 72 mN/m). In these circumstances, there is very little dispersing force between pitch particles, resulting in a strong tendency to agglomerate. Larger pitch agglomerates readily adhere to other hydrophobic surfaces, such as machine fabrics.

Traditionally, the use of surfactants has provided sufficient dispersing power to maintain the separation of pitch particles. This approach, however, is only valid if there is sufficient conductivity or water hardness in the system, to suppress repulsion from the electrical double layer. Ironically, the cleaner the water circuits, the higher the tendency for deposition.

This paper reports on the progress of a development project, designed to manufacture a deposit control product with strong performance in soft water systems. Archroma has recently concluded the trial phase of Cartaspers PLH, with encouraging results. Targeted primarily in the pulping sector, the product is able to replace both inorganic absorbents and pitch dispersants, leading to significant cost savings. Many pulp mills are engaged in energy-saving initiatives, which may compromise the levels of extractives in the finished pulp. Enhancing the removal efficiency of pitch and associated contaminants, with the application of Cartaspers PLH, facilitates lower energy consumption whilst maintaining pulp quality.

New opportunities in paper mills with soft water are also being pursued.

FAR LEFT Bäckhammar Mill's Pia Lundin and Dick Lange Ferm in front of the Celleco Twister hydrocyclones in cleaner stage 1 at PM4. **MIDDLE** Stage 1 of the cleaner plant for PM5 at Bäckhammar Mill. **ABOVE** Bäckhammar Mill is located in Kristinehamn, Sweden.

Raising the bar in **cleaning performance**

The Celleco Twister® hydrocyclone is noted as the one of the most innovative systems in the field of pulp hydrocyclone cleaning and separation technology developed in the last 15 years. The advanced design and technology is said to be raising cleaning performance to a new level while using up to 50% less energy.

It boasts some noteable features including a feed consistency of up to 2%. In comparison, the cleaning performance in conventional hydrocyclones stands at 1%. Celleco Twister hydrocyclone presents considerably lower reject rates than conventional ones.

Tipped as a radical new concept in hydrocyclone technology, along with a twin wall design, it houses three forward cleaners in a single unit and each unit is equipped with the patented two-stage Celleco Twister hydrocyclone working together with the patented Mid-cone Dilution technology.

The Mid-cone Dilution technology re-energises the stock while providing accurate dilution minimising fibre thickening. This enables the Celleco Twister hydrocyclone to have an elongated cone section for higher separation efficiencies without the need to operate it at an elevated pressure drop.

In conjunction, these two technologies enable the energy reduction up to 50% compared to conventional cleaners at the same pressure drop. This energy saving is based on the fact that the Celleco Twister hydrocyclone can operate at feed consistencies of up to 2%.

It is also possible to retrofit existing Cleanpac® 700 hydrocyclone, Cleanpac® 270 system and Tripac™ 90 bank installations with the Celleco Twister hydrocyclone.

GL&V's long-term partnership with Bäckhammar Mill leads to clean results

The amalgamation of two 19th century founded mills - Bäckhammar and Åmotfors – resulted in the formation of Wermland Paper in late 2003.

Located in western Sweden, Wermland Paper focuses on unbleached kraft paper made from Scandinavian fibre. In 2007, Norwegian company Nordic Paper took whole ownership of Wermland Paper AB.

Bäckhammar Mill – an integrated sulphate pulp and paper mill – produces some 175,000 tonnes of unbleached softwood kraft pulp a year; the majority of which supplies Bäckhammar itself and Åmotfors. Bäckhammar's two paper machines have a production capacity of 115–120,000 tonnes with PM4 producing 33,000 tonnes of unbleached machine-glazed paper, both plain and ribbed in 30–120 gsm. PM5 produces 83,000 tonnes of unbleached tensile and highly tensile sack kraft and machine-finished paper of 60–150 gsm. The mill exports 80% of its end products.

The most innovative product developed at the Bäckhammar Mill is a biodegradable sack kraft grade - WP BioKraft. Since its development in the mid nineties, the biodegradable sack paper has been somewhat of a niche product as it is the only compost paper to fulfill biodegradability requirements for Kappa labelling, which guarantees that the paper biodegrades within 112 days; true to its marketing slogan is 'Made to hold. Not to last'.

Over the years, Bäckhammar has increased its production by removing production bottlenecks and mill-wide improvements. During 2006, a major rebuild was done on the short circulation of both PM4 and PM5 to increase production and to improve pulp quality. Core to this upgrade was GL&V, which had the task of increasing the cleaning efficiency and reducing energy consumption.

GL&V's Cleanpac®350 hydrocyclone cleaning system at the mill was modernised in 2006 with a Celleco Twister hydrocyclone in the primary stage of each paper machine's hydrocyclone cleaning system. The existing Cleanpac 350 cleaners remained as a fibre recovery step.

The GL&V Sweden team met with Dick Lange Ferm, mill production manager, and Pia Lundin, process engineer. Both had been instrumental in integrating the Celleco Twister hydrocyclone concept into their production process, and GL&V was interested in the progress to date.

Ferm explains that the decision to install the Celleco Twister hydrocyclone to increase production capacity that the existing Cleanpac 350 hydrocyclone cleaners wasn't able to deliver. "We found an excellent alternative: to run a small portion of the pulp through the Celleco Twister hydrocyclone technology while at the same time increasing the pulp's consistency. It is an excellent concept, definitely worth its price."

"We can run the Celleco Twister hydrocyclone equipment at higher consistency, thus achieving cleaner pulp. The cleaner quality of the pulp can be proven concretely," said Ferm.

The investment in the new equipment brought about an energy saving too as the need for new, larger pumps was negated. "Energy is also saved when production is increased by raising the consistency of the pulp."

"When we began using the Celleco Twister hydrocyclone concept, we didn't need to touch the pumps at all. The production process required only minimal alterations." Ferm adds that the Celleco Twister hydrocyclone processes been easy to run with little, if any, disruption. "In the past two years, we haven't replaced any of the components."

Lundin is positive about the hydrocyclone meeting and maintaining the objectives set for it. "It separates the heavy and sharp particles just as it is supposed to. This way we reduce the wear and abrasion of the pulp pumps and piping."

"As long as we follow GL&V's instructions for running it and keep the original settings, then everything runs like clock-work. We're only left with the general monitoring of the process, with a much cleaner pulp," adds Lundin.

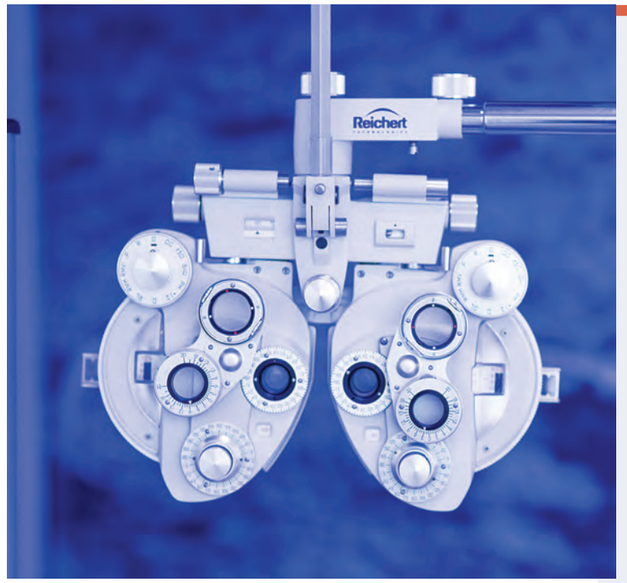
The mill runs the new equipment at a consistency of around 2%, whereas the older Cleanpac process had to be run at a 1% consistency to ensure the pulp's cleanness. For the sack paper grades, the mill has a four-step cleaning process. "The process is still the same, but the flow has been altered," explains Lundin.

"We can run the Celleco Twister hydrocyclone equipment at higher consistency, thus achieving cleaner pulp. Energy is also saved when production is increased by raising the consistency of the pulp."

EYE SAFETY

Keep a healthy eye on the job

March is Workplace Eye Wellness Awareness Month



Not only are our eyes the windows to our souls but, next to our hands, they are the most important tools we have. Our eyes are exposed to various hazards in the workplace regardless of the type of working environment you are in – from operating machines, equipment and tools, to simply working in front of a computer screen. When it comes to our most exposed and sensitive organs, protecting them against injury through prevention is paramount.

The importance of safety eyewear

The majority of eye injuries that occur during work are due to physical abrasions and impact that could be avoided if wearing the appropriate eye protection.

Prevent Blindness, an American non-profit research and vision foundation, reports that even though thousands of eye accidents happen daily, 90% of these would be preventable with safety eyewear. Simply using the proper eye protection in a physically demanding job can prevent eye injuries that result from chemical exposure, foreign objects in the eye or cuts and scrapes on the cornea.

According to Andre Horn, a senior optometrist and managing director at Mellins i-Style, other hazards include oil splatter, steam, exposure to ultraviolet and infrared radiation as well as flying wood splinters or metal chips. “Arming your eyes with safety glasses, protective goggles and helmets with protective face masks can all shield from hazardous materials and substances.”

Eye injuries are just as great a danger to bystanders and thus good eye protection is necessary for people exposed directly or indirectly to the hazards.

In the event of an eye emergency

“A sudden sting in the eye or wound (visible or not), a bloodshot eye, immediate partial or complete loss of vision, leakage of blood or clear fluid from the injured eye and eye contact with hazardous fumes, aerosols and household and garden chemicals and solvents will require immediate medical attention as soon as possible,” advises Horn.

If you are not able to receive treatment right away, the following first aid steps can be taken until medical help is available:

Chemicals and burns:

- Repeatedly rinse the eyes with clean water, saline solution or any other drinkable liquid for 10 to 15 minutes and protect the uninjured eye from contaminated water. A shower, tap, garden hose or a small container with water can be used for this. Keep the eye wide open whilst rinsing. Don’t touch, rub or cover the eye with a bandage.
- If there is a contact lens in the eye, start rinsing immediately and get medical help.

Particles such as dust and sand in the eye:

- Don’t rub the eye.
- Allow tears to rinse the eye or use clean water, a saline solution or eye drops to rinse the eyes and remove the particles.
- While doing this, slightly lift the upper eyelid outward and down over the lower eyelid to remove the particles.
- If the particles don’t wash out, or there is persistent pain light sensitivity and redness, keep the eye closed until you receive medical attention.

Blows to the eye:

- Cover the eye gently with a cold compress such as crushed ice in a plastic bag or wrapped in a soft cloth before seeking medical care.

Cuts, scratches and punctures to the eye or eyelid:

- Don’t try to remove an object that is stuck in the eye.
- Don’t rinse out the eye with water.
- Cover the eye with a firm object that would protect the eye, for example the bottom half of a paper cup. Immediately see your doctor.

Foreign object stuck in the eye or cornea injuries:

- Vision could be affected if an object enters the eye or damages the cornea. If a foreign object or contact lens gets stuck in the eye, don’t try to remove it or apply pressure. Cover the eye gently with gauze or an eye patch and get medical help immediately.

Source: Mellins i-Style

The problem with pixels

It is estimated that we look at our devices, computer screens and TV screens for between six and nine hours per day, and at our cellular phones as many as 80 times per day, which can increase if working in a computer based job. This is challenging our eyes and health significantly. Digital eyestrain or Computer Vision Syndrome (CVS) is a result of our modern lifestyle and the prolonged use of digital devices.

According to Horn, our eyes are put under immense pressure when they have to shift between viewing something at a distance and nearby, small displays and text. “The ciliary muscle and natural lens in the interior of the eye are put under extreme strain as they have to adjust constantly in order to refocus clearly,” says Horn. “As we get older, the lenses and muscles in our eyes gradually lose their elasticity, reducing the eyes’ ability to automatically focus clearly at different distances. Most people need vision correction with the help of spectacles or contact lenses, particularly for the office environment where there is a high level of screen usage.”

CVS can negatively affect performance and productivity and result in unforeseen errors, leaving staff demotivated, fatigued staff. But Horn suggests some easy solutions to limit screen-induced eye strain.

- **Remember the 20/20/20 rule** - Take a 20 second break from your screen every 20 minutes to relax your eyes, by focusing on an object 20 metres away.
- **Position, position, position** - Ergonomics are important, so choose a supportive chair and position it so that your feet are flat on the floor. Position your screen so that it is about an arm’s length away when sitting back in your chair and ensure that your eyes are level with the top of the monitor and you look slightly down at the screen.
- **Tweak your computer settings** by changing your font size and brightness. Text should be about two to three times the size of the smallest text you can read. The computer screen’s brightness should be the same as the area directly behind it and may need adjusting throughout the day if your workspace is lit by natural light.
- **See your optometrist** – If you wear glasses, see your optometrist regularly to check if your lens prescription is up-to-date and adequate for computer use.
- **Wear your spectacles** - Swop contact lenses for spectacles when working in front of a computer, as this may help to reduce eyestrain.
- **Consider digital lenses** - Research and development in optical lens design has resulted in the creation of digital lenses that alleviate the strain caused by continuous computer or tablet use. The design supports the ciliary muscle, therefore making it easier for the wearer to switch vision between near and distance ranges and may help to prevent blurred vision, tired or dry eyes and neck strain.
- **Use an anti-glare screen** to reduce glare from UV light and artificial lights on your computer or tablet screen.
- **Blink more or use eye drops** - When you work at a computer or on a tablet, you are less likely to blink. Blinking keeps your eyes moist and reduces dryness and irritation. If blinking more doesn’t offer relief, especially when wearing contact lenses, use eye drops recommended by your optometrist.
- **Stretch your legs** - Get up from your desk and move around at least every two hours.
- **Change your device settings or use an app** - If you forget to take a break, download a free web or mobile app such as eyeCare-Protect Your Vision, EyeLeo, Eyes Relax and PC Workbreak that will remind you to take regular breaks from your digital devices.

A study by Nottingham Trent University has discovered that the average person checks their device 85 times a day, spending a total of five hours browsing the web and using apps. This equates to around a third of the time a person is awake, and is twice as often as many people even realise. SOURCE: DAILY MAIL UK

HEADWEAR

Heads up for **hard hats**

A hard hat can save your life. Unfortunately, ill-fitting or uncomfortable protective headwear sees many people wearing them incorrectly or removing them altogether. This adds to the risk of head injuries which can result in temporary or permanent brain trauma or even death.

Stephan Poole, supply chain manager from North Safety Products, indicates that serious head injuries can be avoided using a rugged, yet stylish and comfortable hard hat such as the Beluga.

The Beluga hard hat, which was officially launched in the local market in 2013, has undergone all mandatory requirements in accordance with the standard set out by the SABS. “It has been tested for electrical insulation, resistance to penetration and flames, shock absorption and chin strap anchorage strength.”

The hard hat is manufactured locally in accordance with stringent SANS1397:2003 requirements. It is manufactured from either polypropylene (PP) or Acrylonitrile butadiene styrene (ABS) raw material and is also able to withstand impact of up to 5 kN according to the SABS standard. The range is offered in eight standard and seven specialised colours.

In addition to comfort and safety, the Beluga has stylish and modern definitive lines which offer a more modern look. Poole highlights that North has included vents for air circulation to ensure that the wearer stays cooler. “Previously, North did not have a hard hat with the vented option, and decided to design a modern hat with this and many other features, for an all-in-one offering.”

The hat can be tailor-made to a client’s specific needs, with company logo embossing offered in a four-colour option. The hard hat comes in vented and non-vented options, with either plastic or steel lamp brackets, as well as recessed earmuff slots. A sun brim visor offers sun protection on the neck, while a stylish peak offers good protection from the elements, and a water ‘gutter’ assists with water run-off when working in the rain.

North provides a choice for the two liners - the standard click-lock and a ratchet assembly which provide a comfortable fit, as well as the headband. “The hat is fitted with a foam headband but clients can request a leatherette headband as an option.”

CLOCKWISE FROM TOP LEFT: Dipuo Monaheng, with a 10.16% weight loss, came in second; William Mashishi came first with 16.30% weight loss; Mzwandile Sigwane was third with 9% weight loss.

GENERAL WELLNESS

Wellness wins with **Neopak’s Biggest Loser**

Having identified overweight and obesity as one of the risk factors for its employees’ wellbeing over four years ago, Neopak embarked on a wellness programmed in 2012 to help employees manage and control their weight. Taking its name from the reality show, Neopak titled the programme The Biggest Loser.

With a dietician on hand to advise on good eating habits and prescribe a healthy and balanced diet plan, the programme commences at the beginning of each year.

“We always have a good mix of employees, both males and females, across all age groups,” explains Thembi Mahlope, Neopak human resources manager. “The participants weigh in at our clinic every month end. Monthly winners are announced and they get a small incentive to encourage adherence to the programme. The final weigh in happens in October each year. The overall winner is presented with a trophy and a voucher.”

Mahlope reports that the company has seen great benefit from running the programme. “A few people with chronic conditions like high blood pressure and diabetes have seen improvement in their conditions. Our objective is to have a healthier and happier workforce.”

Mahlope acknowledges Sr Ryna Meyer for her good work in managing and coordinating the programme. “Well done to Ryna for her hard work and passion.”

Some of the previous winners lost as much as 20% and 43% on the programme.

2012 Anton Vermeulen with 21% weight loss
2013 Martin Wilkens with 20% weight loss
2014 Petro Badenhorst with 43% weight loss
2015 Lebo Thagane with 25% weight loss

FAR RIGHT North offers a wide variety of padlocks that are available in nylon, aluminium, steel and brass body options.

RIGHT A good LOTO system consists of clearly labelled energy sources and easy-to-follow procedures

RISK MANAGEMENT

Locking out **the hazards**

As with most manufacturing spaces, a pulp and paper operation presents numerous hazards - contact with electricity, steam, high pressure air and water or entanglement in moving machinery through premature restarting. The hazards pose the greatest risks during periods of routine servicing and maintenance.

North Safety Products exports manager Hayley Arnesen explains the most effective means of minimising these risks is by securing and controlling the energy sources with an effective lock-out/tag-out (LOTO) system.

A LOTO system prevents unexpected start-up or release of stored energy by securing a padlock to a clamp in order to lock the machine being serviced or maintained. After being locked, a tag is placed on the machine to indicate that it should not be turned on.

LOTO systems are commonly used in industry and research settings to ensure that machines are properly shut off and not started up again prior to the completion of maintenance or servicing work, in order to avoid danger.

“The lack of a LOTO system, or improper handling of the system, may result in injuries that include; electrocution, burns, crushing, cutting, laceration, amputation, or fracturing of body parts. The unexpected start-ups can also cause extensive damage to the machinery itself, adding to the expense of equipment repairs and replacement to the total cost involved,” she warns.

Arnesen stresses that trained personnel should always manage the LOTO system. “For instance, if a steam valve automatically gets turned on, it might burn the workers who are repairing a downstream connection in the piping. Another scenario is the sudden release of a jammed conveyor system, which can result in the crushing of workers, if not properly managed,” she says.

According to Arnesen, it is the responsibility of the employer to develop and implement an energy control procedure that provides authorised and affected employees with the same level of protection as a personal lock-out or tag-out device.

“A good LOTO system consists not only of clearly labelled energy sources and easy-to-follow procedures, but also quality and accessible lock-out tools to ensure smooth and quick maintenance and servicing activities,” she continues.

North offers a wide variety of padlocks that are available in nylon, aluminium, steel and brass body options. Nylon body padlocks are best-suited to electrical applications, due to the non-conductive properties of the material. Temperature and corrosion-resistant aluminium body padlocks are ideal for high-temperature outdoor applications up to 580°C.

Due to their strong physical resistance characteristics, steel body padlocks are designed for severe physical environments, while spark-resistant brass body padlocks are ideal for use in flammable applications. The North range of padlocks feature shackle diameters ranging from 4,7 mm to 7 mm, and have shackle heights ranging from 20 mm to 75 mm.

Industry guaranteed

According to a report by the Royal Netherlands Paper and Board Association (Royal VNP), the “Lockout Tagout Tryout” as an important safety procedure for its members. The methodology features as one of 22 good practices in CEPI’s Report of Good Health and Safety Practices in the European Pulp and Paper Industry titled ‘No Paper Without Skilled, Healthy and Safe People’.

ERGONOMICS

Protect the bottom line by **having your staff's backs**

Many companies are unknowingly wasting thousands of rands each year through employee absenteeism or staff turnover. This can be put down to the invisible effects of poor workplace ergonomics.

Literally 'the science of work', ergonomics has the goal of improving workplace design to fit the people who use it. This ensures workers are more comfortable, healthier and productive. According to several studies, the return on investment for implementing a good ergonomics programme with quality products is as much as 17:1.

"But it's not just about getting the right chair or laptop stand," says Formfunc managing director Peter Kowalski. "Ergonomics today uses myriad products as well as artificial intelligence designed to quickly screen any workforce for injury and issues so that ergonomic interventions can be tailored for optimal impact."

World-renowned ergonomics expert Professor Alan Hedge visited Johannesburg and Cape Town in February to share valuable insights into the study of people's efficiency in their work environment. "A proactive ergonomics programme can tell companies what issues need to be addressed by good ergonomic design and training so that interventions can be implemented before injuries and productivity losses occurs," Hedge said.

"Companies that invest in good ergonomics have been proven to see better productivity, fewer musculoskeletal injuries and better recruitment and retention because workers are more satisfied."

There is increasing worldwide evidence that ergonomics programmes generate return on investment for companies. "The presence of an organisational-wide approach to health and wellness has long-term financial implications," Hedge said.

In the United States, the National Business Group on Health has found that employers with health and productivity programmes are able to reduce disability days between 10% and 35%, improve return to work rates by at least 6% and experience an ROI ranging from 3:1 to 15:1.

> "A proactive ergonomics programme can tell companies what issues need to be addressed by good ergonomic design and training so that interventions can be implemented before injuries and productivity losses occur."

Proactive ergonomics is essential

Hedge's research themes include workstation design and carpal tunnel syndrome risk factors for workers, alternative keyboard and input system designs, the performance and health effects of postural strain, and the health and comfort impacts of various environmental stressors. These include the impact of indoor air quality on sick building syndrome complaints among office workers, and the effects of office lighting on eyestrain problems among computer workers.

Kowalski said many companies practiced 'reactive ergonomics' where injuries were the trigger for ergonomic interventions. "We hope that by educating the market about ergonomic solutions we will encourage companies to proactively transform their productivity."

Acknowledged as a leader in the field of human factors and ergonomics with more than 30 years of ergonomics design and usability consulting experience, Hedge directs the Human Factors and Ergonomics teaching and research programmes at the Department of Design and Environmental Analysis at Cornell University. Hedge was hosted by Humanscale, a designer and manufacturer of ergonomic products, and its South African distributor Formfunc.

Source: Formfunc, the South African distributor of Humanscale ergonomic products

References for the ergonomics tips below are as follows:

1 Kroemer A.D, Kroemer K.H.E. (2017) Second Edition. Office Ergonomics: Ease and Efficiency at Work. Taylor and Francis Group.

2 Bridger R.S. (2003) Second Edition. Introduction to Ergonomics. Taylor and Francis Group.

3 Parsons J.J. and Oja D. (2010) Seventh Edition. Computer Concepts.

4 Stack T., Ostrom L.T. and Wilhelmsen C.A. (2016) Occupational Ergonomics: a practical approach. John Wiley & Sons, Inc.

Ergonomics tips

A KEYBOARD DISTANCE
Your keyboard should be placed close to the edge of the desk. Remove or flatten the feet on the keyboard as this will reduce wrist extension and it will create a neutral wrist posture. The keyboard should be placed directly in front of you at arms reach.[1]

B MONITOR DISTANCE (including laptop)
Place the monitor at least an arm's length away while reclining.[3]

C CENTRE KEYBOARD in line with the body and close to the edge of the desk, within arms reach.[1]

D MOUSE DISTANCE
Your mouse should be placed as close to the keyboard as possible to reduce your required reach.[1]

E MORE MONITORS
Angle the monitors inwards and close together to reduce the amount of neck/head movement.[3]

F MONITOR HEIGHT (including laptop)
Align the top of the monitor at, or slightly below, eye level.[4]

G DOCUMENT POSITION
Your documents can either be positioned between (and in line with) the monitor and keyboard or close to the side of the monitor in a document holder. This will reduce twisting to the side to view documents which will cause discomfort.[1]

H ARMREST HEIGHT
Position the armrests such that they are no higher than seated elbow height, when the elbows are at 90 degrees. When the arms are supported then there is less muscle activity in the neck and upper back and less pressure placed on the lumber spine.[2]

I SEAT LENGTH
Seat length should be adjustable to ensure there is a slight gap (2 inches) between the seat edge and the back of your knees as this will reduce under thigh pressure.[2]

J SEAT HEIGHT
Seat height should be knee height. Adjust the seat height so that your feet are flat on the ground and your hips are higher than your knees. A footrest is needed if your feet are not firmly on the floor.[2]

K LUMBAR SUPPORT
The Diffrient World chair's tri-panel backrest hugs the body to provide tailor-made lumbar support. Lumbar support needs to be contoured to support the back/spine.[2]

TELEPHONE POSITION
Your telephone should be placed on the opposite side of your non dominant hand as this reduces the risk of nerve impingement in the neck. If you are constantly using your telephone, it should also be placed within arms reach.[1]

HEAT EXPOSURE

Beat the heat with hydration

Working in hot conditions poses particular hazards to safety and health. According to Hayley Arnesen, North Safey Products, heat illnesses combined with dehydration can be a direct cause of approximately half of heat stroke incidents among machine operators and mill employees. The health risk can also affect the safety of an employee through the heat exhaustion, loss of concentration or fainting. Further to this lower productivity and morale will have a knock-on on operating costs.

Arnesen says, “During heavy work, muscles need more blood flow, which reduces the amount of blood available to flow to the skin in order to release heat. The body defends itself from heat through breathing, sweating and changing the blood flow. Individuals with high blood pressure or heart conditions and those who take diuretics may be more sensitive to heat exposure.”

“It is advisable to replace the fluids lost from sweating by drinking an electrolyte solution, wearing loose fitting clothing and a hat, and getting sufficient cool air. Businesses should ensure that employees and supervisors have proper training to be able to detect early signs of heat stress and understand the importance of replacing fluids and salt from sweat,” she continues.

Know the signs

Heat exhaustion results from working up a sweat and not replenishing the body with enough fluids. Resting in a cool place and avoiding caffeinated beverages are some of the things that will relieve the condition. Heat stroke, which can result in death, is caused by the failure of the body to regulate its core temperature. In order to reduce the effects, the victim should be moved to a cool area and soaked in cool water, amongst other things.

Heat cramps are painful muscle spasms that occur when a worker drinks a lot of water, but does not replace the salts. Fainting can occur in someone who is not used to working in uncomfortably hot environments. Heat rash usually occurs in hot and humid environments where sweat cannot evaporate easily. It can be prevented by resting in a cool place, keeping skin clean and dry, as well as over-the-counter lotions to ease pain and itching.

Appropriate engineering controls, personal protective equipment and work practices are also imperative to reducing the risk of heat stress. Supervisors should provide enough liquids and ensure that work schedules allow for appropriate rest periods.

Employees need to choose a suitable hydration drink that is accessible before, during and after work. The hydration drink will assist in maintaining blood volume, which allows for efficient delivery of oxygen to working muscles and reduces the incidence of muscular cramps.

Water is not enough

Arnesen warns that only providing water for hydration may lead to a low blood sodium level, as salts are not sufficiently replenished. People exposed to heat hazards must consume approximately 300ml (about a cup) of an electrolyte replacement drink 20 minutes before possible exposure. The sodium content should be between 25mg and 70mg per 100ml. Intestinal absorption is improved by small volumes of carbohydrates, between 3g to 5g per 100ml. “The temperature of the liquid can also impact the absorption rate – cooler drinks are absorbed more easily,” explains Arnesen.

Dynaforce developed by North Safety offers a solution. “The drink, which comes in a 60g, 240g and 25kg bulk pack, has a potassium content that exceeds that of other similar drinks. The benefit of this is the positive fluid retention effect that the potassium exerts at a cellular level. The powdered drink carries various other vitamins and minerals and has no preservatives,” Arnesen concludes.

Dynaforce is a rehydration drink that replenishes the body of essential nutrients for those working in hot environments. It is available in four different flavours.

SUBSTANCE ABUSE

Get back to basics with substance abuse at work

Alcohol and drug consumption is on the rise – both in leisure time and within the factory gates. Not only does it influence the individual and their families in various ways, it can also affect the employer, fellow employees and equipment. Working while inebriated or under the influence of alcohol or drugs not only increases the risk of a personal injury or fatality, but it can also affect the safety of other colleagues.

When alcohol is consumed, response rates are slower and reflexes are dulled. In general, the person works more slowly and introduces a host of dangers to the working environment.

Rhys Evans, director at ALCO-Safe, says, "Companies must go back to basics and look at firstly creating drug and alcohol policies as the foundation. They should also ensure their employees are educated on the risks of consumption while at work.”

Evans notes that creating a responsible attitude is a priority; it is still acceptable to consume alcohol in moderation during leisure time; consumption of drugs or alcohol in a work environment is not.

“The second phase is to implement regular drug and alcohol testing, before the employee or contractor enters and leaves the work premises." After all, it is a requirement of the Occupational Health and Safety Act.

Tried and tested

There are a number of alcohol and drug tests available that are suited to different environments. ALCO-Safe distributes the Lion AlcoBlow RapidTest which delivers a fast, accurate 'pass or fail' result where large numbers of employees need to be tested.

Furthermore, it uses only a tiny sample of breath, without the need for physical contact between the person and the instrument. It can also be used in both active and passive modes to ensure all employees can be tested quickly and efficiently, and that suspicious liquids can be checked for the presence of alcohol.

There are also a variety of drug testing kits available including urine and saliva tests suitable for different scenarios.

- Dip test - strips are dipped into a urine sample and can obtain readings for testing a single drug or a range of commonly abused drugs.
- Cassette test - this multi-drug test requires the operator to use a pipette to drop a urine sample into each window for testing.
- Integrated cup tests incorporate the test panel into the sample cup. The cup tests are extremely popular as they have functionality to check the urine is at body temperature.

However, urine testing is not suitable for all applications. For reasons of privacy, females must be tested by females, and males by males. Urine testing is not possible where toilets are not readily available; saliva testing provides a convenient alternative.

Saliva testing uses a swab to produce results in a matter of minutes, and can be used to screen for a panel of five common illegal substances including heroine (Nyaope), cocaine, marijuana and methamphetamines, which include substances such as tik, ecstasy and khat.

“One of our latest developments is a key management system,” explains Evans. “This ensures that no driver is given access to vehicle keys or keys to a high-risk areas if alcohol is detected in their body. This decreases the chance of accidents and enhances security.”

Photo: ALCO-Safe

WELDING

Safer pipe weld purging for closing welds

Weld purging a variety of pipes of different diameters can prove complex and costly, particularly when having to fill whole pipework systems with expensive argon gas. One solution that welders have traditionally devised has been to construct 'homemade' foam or paper dams that are placed either side of the weld, constricting the purge volume to make weld purging times shorter.

Homemade foam or paper purge dams have severe technical limitations that can lead to loss of welds when they leak or slip from position thus flooding the welding zone with oxygen. To overcome these challenges, weld purging experts Huntingdon Fusion Techniques HFT® have designed and developed Argweld® Weld Purge Film® kits to make weld purging affordable and successful. Georgia Gascoyne, CEO for HFT®, said: "Using our low cost kits can save welders both time and money, ensuring oxide-free welds are achieved time and time again."

"This water-soluble Weld Purge Film® allows dams to be cut easily with the safety knife provided and once they are fixed into position using the provided water-soluble Weld Purge Super Adhesive® produce an impenetrable purge barrier that can easily be washed away during hydrostatic testing of the pipe or just by normal wash-out."

Ron Sewell, Chairman for HFT®, commented on the use of the solution in the pulp and paper industry: "We've had many success stories where our weld purging equipment has been used in the pulp and paper industry. For example when stainless steel or chrome steel pipe joints are welded for the pulp and paper mills, the finished joint on the inside has to be free of contaminating oxygen and totally free of any protrusions or crevices.

"One welder reported the damaged caused by a protrusion to be extremely costly. Fibres picked up, accumulating into lumps, falling into the product flow and eventually spoiling large complete rolls before the problem was spotted. Then a long search and inspection, finding the offending part, cutting it out and inserting a new piece with two welds instead of one. All of which can be eliminated with the use of our Weld Purge Film®."

The kits can be used on pipe diameters up to 900 mm (36") and for temperatures up to 300 ºC (572 ºF) without the material burning and losing the weld purge. These low cost kits will save operators high costs by minimising gas usage and dramatically reducing the time taken to make a purge. They have been designed and developed by HFT®, containing product accessories needed to manufacture dams that will not come loose during welding.

The technical advantages of using water-soluble film instead of other materials include:

- The total transparency of the film dams, allows the welder to see the weld root as it is being laid.
- Vapour pressure of the film is very low and does not outgas harmful elements during welding that can mix with the hot metal and cause metallurgical defects.
- The Argweld® Film does not contain water like paper and sponge products do.

After welding, the water-soluble film is simply washed away during the standard hydrotest cycle or by flushing of the pipe interior and dissolved down to molecular level, leaving no trace.

SAFETY ALARMS

Integrated Alarm and Control System

Detcon Model X40 is a low-power alarm and control system designed to monitor multiple gas detection sensors and a wide range of other field devices. The versatile control system is designed to receive and supervise inputs using either 4-20mA or serial RS-485 Modbus and is available in two packages: Model X40-8 and Model X40-32.

Both packages function as a Modbus master and can be customised and expanded, based on individual application needs using Detcon's stackable DIN-rail mounted I/O modules. All modules are individually addressable and operate on 11,5– 30 VDC. The X40-8 provides power for up to eight field devices and can house up to six 4-channel I/O modules. The X40-32 provides power for up to 32 field devices and can house up to twelve 4-channel I/O modules. Detcon I/O modules include a 4-channel 4-20 mA input module, a 4-alarm relay output module, a 4-channel 4-20mA output module and a 4-relay contact input module. The modules can be mounted within the main system enclosure or installed remotely to simplify field wiring.

The Model X40 is completely field programmable using a small handheld magnet and offers advanced technology with intuitive, embedded intelligence. The control system displays real-time readings and field device status on a backlit LCD screen. During normal operation the screen displays the alarm status and current reading (ie, channel number, gas type, and gas concentration) for up to eight field devices simultaneously. The display is sequential and during normal operation it auto cycles through each of the active channel screens.

A wireless option is available that can be used with Detcon's RXT-320 SmartWireless transceivers.

PRESSURE TRANSMITTERS

ATEX pressure transmitter range
for hazardous areas, gas, dust atmospheres

Keller, represented locally by Instrotech, has introduced a complete range of pressure transmitters for use in hazardous areas. These intrinsically safe transmitters offer measurement ranges of between 0.2 bar and 1,000 bar, so they can be used for measurements of all types in areas subject to explosion hazards in Group II (Gas), and as per the relevant ATEX Directive.

Common features of all Y-line pressure transmitters include a very low temperature error, with correspondingly high measurement accuracy. Thanks to the integrated temperature sensor and an additional digital circuit, the range of envisaged operating temperatures can be divided into as many as 120 sections with a width of 1.5 Kelvin. During factory calibration, a mathematical model is used to calculate individual compensation values for TK zero point and TK amplification for each of these sections; the values are then stored in the transmitter.

During operation, these values are fed into the analog signal path according to the temperature, without reducing the 2kHz signal processing dynamic. A relevant total error band for measurement purposes of ±0,8 %FS can therefore be attained over the typical temperature range of -10°C to +80°C. This includes all error sources, from linearity to range tolerance.

As an additional feature, Keller's X-line pressure transmitters (Series 30) offer microcontroller-based electronic evaluation to ensure maximum accuracy. Each transmitter is gauged across the entire pressure and temperature range. This measurement data is used to calculate a mathematical model that enables correction of all reproducible errors. In this way, Keller can guarantee high accuracy on the basis of an error bandwidth within the overall compensated pressure and temperature range. The user of industrial transmitters may specify a choice of compensated temperature range at time of purchase, depending upon the application; i.e. either -10…80°C or 10…40°C. Otherwise, level transmitters are provided with a compensated range of 0…50°C.

The calculated pressure value can be read via the interface, and is simultaneously processed as an analog signal. At the digital output, the error band between 10...40 C is a maximum of ±0,05% of the full range.

A varied selection of structural designs, electrical signals and mechanical connection formats guarantee that these intrinsically safe pressure transmitters can be used for an extensive range of applications.

The range includes models with internal seals as well as fully welded and flush front-sealed versions that measure pressure in absolute or barometric terms, or relative to ambient pressure. Various threads are available for the pressure connection, and different plugs and cables can be used for the electrical connection.

Users can also choose between typical industrial measurement signals with 3-wire technology (0…5V / 0...10V) or 2-wire technology (4…20A); on the high-precision pressure transmitters and submersible sensors in Series 30, an additional RS485 interface is available in addition to the analog output.

NANOCELLULOSE

Processum leads major nanocellulose project

Producing crystalline nanocellulose (CNC) on a large scale is under the microscope with a multi-party project in northern Sweden. Led by Processum, the four-year project will develop the test bed – coined TinyBTalented, establish working methods and explore new or future applications.The characteristics of CNC lend itself for use as construction material, biocomposites, printed electronics and paint additives.

With a budget of 8 million SEK, the project boasts many participants, i.e. Holmen, Melodea, Mid Sweden University, MoRe Research, Organofuel, RISE Chemistry, Materials and Surfaces as well as S2Medical, SEKAB E-Technology and Tetra Pak. Expected to be completed in November 2020, the project will see participants collaborating or working separately in the four application areas of (1) CNC in flat shaped materials, (2) in wound dressings, (3) as strength additive in multi-layer materials and (4) for functionalisation of gas and fluid barriers.

At present a pilot plant for production of CNC is being built in Örnsköldsvik in northern Sweden. This plant - the first of its kind in Europe - is an important step in making new generation biobased materials on a larger scale.

It will be really exciting to develop a test bed based on CNC together with our partners, yet again highlighting the potential of the biomass we have all around us, the forest.

EMMA JOHANSSON (PROJECT LEADER, TINYBTALENTED)

Emma Johansson, R&D engineer at Processum and project leader for TinyBTalented, “We have an integrated infrastructure for biorefinery development with capability and competence to demonstrate whole or parts of process lines from raw material to finished product on pilot as well as demonstration scale. It is an excellent basis for development of crystalline nanocellulose.”

TinyBTalented gets its name from the fact that CNC comprises exceptionally tiny but very talented molecules that can be used in countless applications.

Standing up to **renewability**

VTT Technical Research Centre of Finland Ltd has developed lightweight 100% bio-based stand-up pouches with high technical performance in oxygen, grease and mineral oil barrier properties using different bio-based coatings on paper substrate. The pouches exploit VTT’s patent pending high consistency enzymatic fibrillation of cellulose (HefCel) technology. HefCel technology provides a low-cost method for nanocellulose production resulting in a tenfold increase in the solids content of nanocellulose. The stand-up pouch is the fastest growing type of packaging, growing at a rate of 6.5% per year from 2015-2020.

Photo: VTT

PAPER BY-PRODUCTS

New use for sludge and fly ash in plastics

VTT Technical Research Centre of Finland has examined, as part of the EU’s Reffibre project, whether new industrial applications could be developed for various types of sludge and fly ash generated by the paper and board industry.

ABOVE Up to half of oil-based polypropylene can be replaced with paper industry side streams. Plastec Finland Oy and Wiitta Oy made a trial batch of floor tiles and storage containers, of which side-streams accounted for 30%.

Laboratory tests showed that these side streams can replace up to 50% of oil-based polypropylene and could be used as a raw material in plastic composites made using injection moulding and extrusion.

Significant quantities of various side streams are created during the manufacture of paper and cardboard, some of which instead of natural aggregates as a raw material in concrete or asphalt, or in construction. However landfill is often the destination for most by-product.

Side streams could be used to lower composite manufacturing costs, reduce the environmental impacts of production, and lower the total amount of waste. This would also reduce the production of oil-based plastics. Laboratory tests showed that 50% of the raw materials in injection-moulded composite could come from paper and board industry side streams.

During the project, Plastec Finland Oy and Wiitta Oy produced floor tiles and storage containers, of which side-streams accounted for 30%. New applications are continually being sought. Paper sludge could be the basis of pallets and crates, for example. The possible legal restrictions still have to be explored prior to the product-specific use of side-streams in composites.

VTT coordinated the multistakeholder Reffibre project (No. 604187), which formed part of the EU’s Seventh Framework Programme, during 2013-2016.

LOCAL NEWS


Photo: Sappi

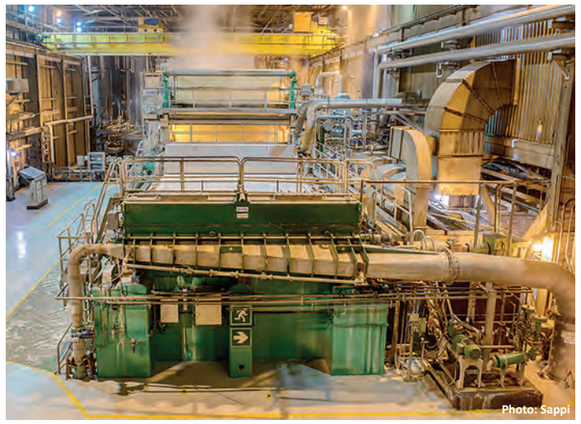


Photo: Sappi

Sappi Ngodwana to get a new evaporation line

Valmet will supply an evaporation line to Sappi's Ngodwana pulp mill, improving the mill's steam economy and, together with existing evaporation line 2, meet the future needs of the mill's ongoing pulp production capacity expansion.

Evaporation line 2 was upgraded by Valmet in 2013, and the newer installation - line 3 - will replace the current line 1. Scheduled start-up is during the latter part of 2018. The upgrade encompasses a six-effect evaporation line tailor-made for dissolving pulp liquor application and covers main evaporator effects, a surface condenser, flash tanks, platforms and main supporting structures, a vacuum system, as well as vapour ducting and liquor circulation piping.

The new line will feature the same REVAP Concentrator technology as that was used for the 2013 upgrade, as well as five Tube Evaporators. It also includes Valmet's patented ICT (Internal Condensate Treatment) for producing more clean condensate for recycling in the mill through the effective removal of organic contaminants, and maximum reuse of condensates as process water in the pulping process. Line 3 will have a design capacity of 310 tonnes of water per hour, producing heavy liquor at 70% dry solids.

By increasing dry solids concentration, the mill can improve its recovery boiler capacity and performance, and in turn steam production. With evaporation of black liquor being the largest single consumer of process steam in a pulp mill, this upgrade will also serve to enhance process energy efficiency.

"The number 1 evaporator plant at Sappi's Ngodwana Mill was commissioned when the mill was built in 1966. Recent upgrades to the mill's product line and production expansions provided an opportunity to replace the original evaporator plant with a modern state of the art plant. Various companies submitted proposals for the expansion project and Valmet was successful in their submission for various reasons, including offering the best technical solution," says SW Engelbrecht, General Manager, Sappi Ngodwana Mill.

"Valmet's global teams, including the South African organisation, have worked together with Sappi teams to create a new high efficiency evaporation line for dissolving pulp liquor, an application where we have many good modern references globally," says B Syamsundar, Sales Director, Pulp and Energy, Valmet.

Sappi Limited launches new website highlighting global presence, increased functionality and robust educational resources

Sappi has launched its new website - www.sappi.com - with significant updates for customers, investors, employees and other stakeholders.

This redesigned website is one of the many steps Sappi is taking to unite its global divisions as part of its groundbreaking 2020Vision strategy, which seeks to pursue growth opportunities in the woodfibre industry.

It features full descriptions of products and services offered; comprehensive award-winning educational materials for customers; in-depth sustainability reporting; easy access to corporate social responsibility efforts like Ideas That Matter; dynamic portals for customers and investors and a prominent social media presence. The site will also feature user personalisation, ensuring that the most relevant information is provided first to frequent visitors.


Sealing the deal is Rupert Haslinger representing Euro-Technology (left), with Rogortec father and son team Richard and Roger Philps

Rogortec aligns with Euro-Technology PPT

Founded by Roger Philps, Rogortec has been serving the South African pulp and paper industry for two decades. Based in Durban, Rogortec represents Xerium with its Huyck.Wangner & Stowe Woodward brands of machine clothing and press roll covers and Weger's Cleantech division which supplies high pressure showers and ceramic and ruby nozzles.

Also within its portfolio is GL&V, suppliers of a wide range of pulp mill and stock preparation equipment. GL&V is particularly renowned for its compact presses for pulp washing, medium consistency pumps and mixers, hydrocyclone cleaners, disc refiners and plates along with complete upgrades of existing Beloit Jones refiners.

The company recently announced that it would be joining forces with Euro-Technology PPT, which for many years has been the sole representative for BTG, a multinational provider of specialised process solutions including a wide range of sensors and ceramic blades.

The newly announced partnership will see improved customer support and service. In terms of the agreement, Rogortec will become a shareholder of Euro-Technology and give support in daily operation and administration as well as assisting with sales and marketing function. Training will also be carried out on the technical aspects and trouble shooting of the product range.

"The synergy created by the combined companies will offer exceptional process support to the local mills," says Roger Philps, founder and managing director of Rogortec.

Read about GL&V's successful installation of the Celleco Twister® hydrocyclone at Sweden's Bäckhammar mill on page 30.

Terex MHPS supplies first-ever Demag cranes for a paper-roll store in Africa

August 2017 should see the installation of two new Demag cranes in the new paper-roll store at Mpact's Felixton mill in northern KwaZulu-Natal. Supplied by Terex, this represents the first-ever order for Demag technology for a paper-roll store in Africa.

The investment is part of the two-phase upgrade which will increase the mill's capacity by 60,000 tonnes to 215,000 tonnes. The crane installation will ensure that paper rolls are stored carefully and retrieved in time. The capacity of the new store is 14,200 tonnes, at a fill capacity of 80%. The paper-roll store receives and despatches product on a 24/7 basis. The two identical Demag cranes supplied are equipped with vacuum lifting devices to provide for fast, gentle storage and retrieval of the unwrapped paper rolls. Material can be stacked up to a maximum height of 15.1m. The cranes are designed to transport up to 63 rolls an hour.

Up to 650 tonnes of paper has to be loaded in the new paper-roll store every day. The paper rolls, configured to meet individual customer specifications, measure 500mm to 2,500mm in width, and weigh 370kg to 3,300kg. The paper-roll store covers a total area of over 2,700m^2. During periods of no loading, paper rolls are aggregated according to scheduled deliveries and staged for retrieval. Thanks to the accuracy of the cranes and the 'smart' Warehouse Management System (WMS), the available storage space is utilised optimally.

"The automated shipping store with the two cranes accommodates the entire output of the paper mill. Investment in the state-of-the-art paper machine technology will boost the quality of our finished goods stocks, as well as efficiency and competitiveness," explained Mpact Felixton mill manager Brian Smith.

"We are delighted with the confidence placed in us by Mpact. The scope of this project involves our automated Demag process cranes. This is the first-ever order for cranes for a paper-roll store in Africa," reveals Lutz Dowy, Vice President Sales & Service for the EMEAR region at Terex MHPS.

Terex MHPS is supplying two new Demag cranes to Mpact South Africa

South Africa's 66% paper recovery rate **exceeds global average**

Recovered paper fibre has been used in South Africa as a raw material since 1920 and is thus a well-established waste stream. Locally and sustainably produced paper is a renewable resource with recycling featuring as a key component in the lifecycle of many paper products. But how much is actually recovered for reuse by the paper and paper packaging sector?

In 2001, the Paper Recycling Association of South Africa (PRASA) reported a 38% paper recovery rate, rising to 59% in 2011. The association projected paper recycling rates to increase to 63% by the end of 2017 but by 2016 the paper and paper packaging industry well exceeded this with its 2015 figure of 66% of the nation's recoverable paper and cardboard being recycled into new paper products.

"The 1.2 million tonnes of recyclable paper and paper packaging diverted from landfill in 2015 equated to 1,435 Olympic-sized swimming pools," explains PRASA operations director Ursula Henneberry.

This means the country is well ahead of the global average of 57.9% as reported by the International Council of Forest and Paper Association (ICFPA) in its 2015 report.

Renewable and recyclable paper packaging - a prominent part of daily life

From sturdy fruit boxes and colourful cereal boxes to the classic toilet roll core, and from egg boxes to milk and juice cartons, a large proportion of paper packaging is recyclable. Once recovered, the paper fibre is repulped and made into new paper products that we use every day.

"Some paper products cannot be recovered for recycling because they are kept for long periods of time such as books or archived in the form of business and financial records; others are destroyed or contaminated when used like tissue and hygiene products," comments Henneberry.

Promise for paper recycling

The growth in paper recovery rates is a promising trend for the country because of the environmental benefits to recycling. Recycling lessens the impact on already pressured landfill sites since the need for landfilling is avoided. One tonne of recovered paper saves three cubic metres of landfill space.

Recycling also opens up entrepreneurial opportunities for unemployed or unskilled citizens and provides dignified work for informal collectors especially if residents and businesses separate their recyclables from non-recyclable and food waste.

South Africans can definitely do more by being more disciplined with office and home recycling programmes - by using free and paid collection services or supporting school and community centres with their fundraising recycling initiatives.

"A very practical way to improve your paper recycling habits is to keep paper clean and dry, and separate from wet waste and other recyclables, and putting it on the pavement for an informal collector. This not only gives these people money in their pockets, but also gives them dignity," says Henneberry.

Photo: Mpact Recycling

LEFT Informal recycling collectors are the unsung heroes of South Africa's recycling success.

South Africa shows progress in recycling

While the country does not have the same ease of recycling for the everyday consumer that exists in developed countries, such as recycling bins in every park or on every street corner, South Africa can be proud that it ranks firmly among the developed market rates. Apart of industry-led programmes, South Africa's successful paper recovery can be largely attributed to the informal collector sector," notes Henneberry.

Other BRICS countries, and even many developed countries, do not perform as well, such as Brazil at 47% and China at 44.7%. An article in The Hindu Times puts the level of recovery and utilisation of waste paper by paper mills in India at 27% of the total paper and paperboard consumed. On the top end of the scale, Australia recycles 85% of its paper and paper packaging.

Sustainability at the centre of **PAMSA's inaugural report**

"Paper, in its countless forms, touches our lives every day and it's a relationship that often goes unnoticed. We use it without a second thought – from our first cup of coffee and morning ablutions, to eating yoghurt, popping our vitamins or putting on lipstick."

So says Jane Molony, executive director of the Paper Manufacturers Association of South Africa (PAMSA) in the report. "Paper products are an enabler. Without them many industries would not be able to convey their messages, ship their products and deliver their goods. As the basis for tissue, paper is a bathroom essential and helps to improve lives through personal hygiene. As a medium through which learning is facilitated, paper educates and informs," she adds.

Telling the fibre story

PAMSA's industry report, Paper in Perspective 2016, tells a number of stories – the economic story, the sustainability story and the recycling story. It also delves into PAMSA's efforts in the education, training and research space, and entrepreneurship training for recycling collectors.

Handy reference

Paper in Perspective 2016 is a one-stop guide to the South African pulp and paper making industry, its members and the vast scope of their activities. As a reference document, it will be of great value to industry commentators, journalists, economists, educators, students of all ages and people considering making a career in a vibrant and technologically advanced industry with an exciting future. Naturally the publication has been printed on certified, sustainably produced paper, but is also available for download – and desktop printing – on www.thepaperstory.co.za.

Twinsaver Group acquires Validus Medical

The Twinsaver Group, a manufacturer of branded tissue products in South Africa, has acquired Validus Medical, a producer of hygienic disposable products, signaling it says 'a new chapter in Twinsaver's journey as it focuses on establishing the business as a diversified FMCG company'.

Garth Towell, Twinsaver Group CEO, said, "We are very excited to welcome the Validus team to the Twinsaver family. The acquisition is a significant move forward for our business as it will enable us to further diversify our product proposition, service new consumer segments and accelerate Validus' growth through investments into technology, talent and access to wider networks."

Established in 2005, Validus has grown its national portfolio of quality disposable medical products across South Africa's hospital, frail care and baby care industries. Known for brands like Clemens and Bumbies, the sale will provide Validus with the capital required to expand into ancillary and new categories.

Commenting on the decision to sell, Folkmar Geyer, managing director at Validus Medical said, "The synergies between Twinsaver and Validus are many; both businesses are market leaders, our products are complementary and our heritage, proudly South African.

The added advantage is that the sale will help increase Validus' production efficiencies and as a wider business, will help bolster the output of South Africa's manufacturing industry."

"South Africa's manufacturing sector has been widely publicised as a gateway to enhancing the global competiveness of the country," said Towell. "With the sector contributing more than 15% to the national GDP, we believe our business and the investments we make, play a vital role in unlocking the deeper potential within the sector.

"What's particularly encouraging are the findings in the Industrial Development Corporation's 2016 Economic Overview which ranked the business confidence in the paper and paper products industry above all other manufacturing sub-sectors."

The sale is subject to regulatory and Competition Commission approval.

ABOVE LEFT, RIGHT Validus brands of disposable hygiene products include Clemens adult diapers and linen savers, and Bumbies wipes.

ABOVE CENTRE, left to right: Folkmar Geyer, managing director at Validus Medical; Dion de Graaf, Chief Operating Officer at The Twinsaver Group and Garth Towell, CEO, The Twinsaver Group.

More about Validus Medical

Validus Medical employs more than 75 people across South Africa. Its factory is located in the Ekandustria industrial area of Bronkhorstspruit. The company operates high speed, fully automated production lines for adult diapers, feminine hygiene products, baby diapers, wipes, draw sheets and linen savers.

FORESTRY

ICFR celebrates three score and ten

SIDHIKA NAIDOO

Collaboration, partnerships, research, knowledge sharing, networking and some celebrations. These are just some of the things that 2017 promises bring for the Institute for Commercial Forestry Research (ICFR).

With this year being the ICFR's 70th birthday, the institute has over the years proudly established itself as a preferred research partner in supporting the South African forestry sector.

The ICFR evolved from the Wattle Research Institute (WRI) which was established in 1947 and formally inaugurated on 13 September 1984. Research carried out at the ICFR covers a broad range of applied aspects of commercial timber growing and harvesting, and addresses current and future challenges in a changing South African forestry sector. Current research focus areas include forest management, risk mitigation, site potential, hardwood tree improvement (eucalypts and acacia) as well as knowledge management.

A team of talented researchers, technicians and support staff are focussed on a suite of projects funded by the private and public sectors. In many cases these rely both on using in-house skills and expertise as well as through forming collaborations and partnerships.

Two notable events on the ICFR calendar are the Annual Research Meeting (held on 7 and 8 March) and the seventh Forest Science Symposium.

The Forest Science Symposium in July is being hosted by the ICFR and the International Union of Forest Research Organisations (IUFRO) in collaboration with the Department of Agriculture, Forestry and Fisheries (DAFF) and other research partners. Under the theme 'Research Underpinning the Sustainability of a Diverse Forestry Sector', the sessions will explore forestry research broadly, looking at natural forests, plantations and woodlands, the range of genera and species, geographical and environmental variation, and the diversity of people and products.

Recognised leaders in forestry research have been targeted as keynote speakers for the symposium. They will highlight research initiatives from across the region's forest research community and promote the critical role of research and technology in supporting decision-making at all levels across both public and private sectors. In addition to the regular format for papers, this year the symposium will incorporate new forms of knowledge sharing including panel discussions and speaker's corners.

The event is recognised as a valuable knowledge sharing and networking forum for all those in the South African forestry community.

Coupled with this event, IUFRO is planning a three-day pre-symposium training workshop as part of their special programme for developing capacities, namely 'Systematic Review in Forest Science'.

For more information: Sally Upfold sally.upfold@ukzn.ac.za | 033-3862314 | www.icfr.ukzn.ac.za

Dates to diarise:

- 28 April: Deadline for abstract submission for Forest Science Symposium
- 30 June: Deadline to register for Forest Science Symposium
- 18 – 20 July: Forest Science Symposium (One Life Church in Alexandra Road, Pietermaritzburg)

FORESTRY SOUTH AFRICA

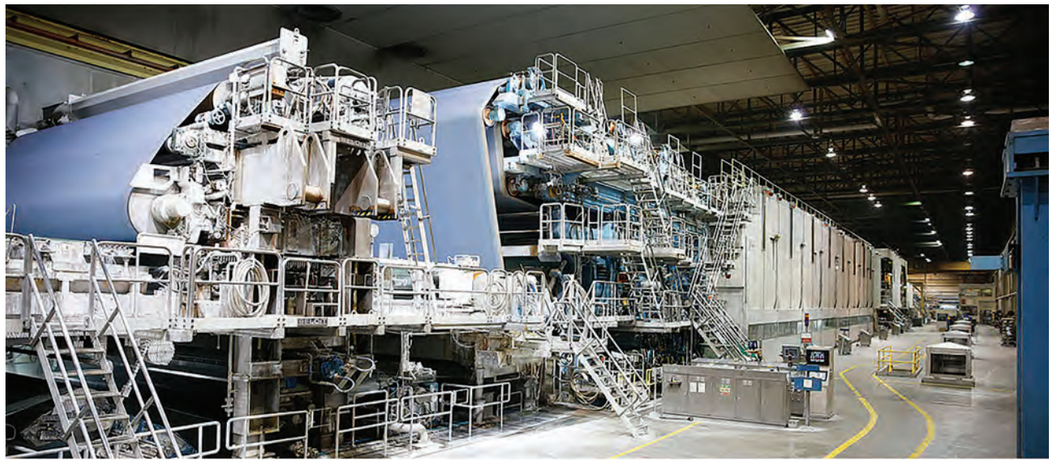
New website explains the ins and outs of forestry

The United Nations International Day of Forests on 21 March 2017 was marked by Forestry South Africa with the launch of an information and illustration-rich website, 'Forestry Explained'.

The new portal, www.forestryexplained.co.za, offers itself as 'a beginner's guide to forestry in South Africa' and caters for users of all ages. It covers the basics of forestry and forest products and everything from water-use to recreation, pest control, ownership and end-uses.

Forestry Explained communicates the complexities of commercial forestry in a refreshing way. It's well worth a visit.

PROCESS



Sappi North America and Valmet set up for Somerset rebuild

Sappi Limited will be investing US$165 million in a capital project to expand Sappi North America's manufacturing capabilities and flexibility to include a variety of consumer packaging products.

The investment in PM1 at its Somerset Mill in Skowhegan, Maine 'establishes a strong platform for growth in paper-based packaging while maintaining Sappi's leadership position in the graphic paper market, increasing annual production capacity at this mill to almost one million tonnes per annum', said a company statement.

As a result of the rebuild, the paper machine (PM1) will be able to produce both coated paper and a variety of consumer packaging products.

"Somerset's existing world class infrastructure together with its talented workforce and access to high quality fibre makes the mill an excellent and obvious choice for this investment," said Mark Gardner, President and CEO of Sappi North America. "Increasing our flexibility and expanding the paper mill's capability and capacity will ensure that we continue to make superior products at Somerset for years to come."

PM1, which currently produces woodfree coated paper grades, will be rebuilt by Valmet produce a variety of both packaging and coated paper products. The upgrade will include a number of modification and new machine parts in the existing machine to meet the requirements of the new packaging grades.

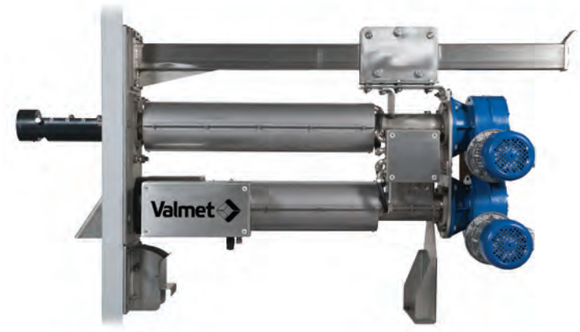
"This move complements our long term 2020Vision strategy, which seeks opportunities to substantially increase our group EBITDA," said Steve Binnie, CEO of Sappi Limited. "By investing in our business to pursue growing areas of demand, we can remain profitable and competitive in the global marketplace."

The planned project at the Somerset Mill in Maine is slated to come online early in 2018.

RIGHT Sales and project teams from Sappi and Valmet.

Valmet introduces a new online analyser
for wood chip and bark moisture measurement

Valmet's Chip 'n' Bark Moisture Analyser (Valmet CBA) offers pulp mills a new tool to advance productivity and efficiency. Continuously measuring wood chip moisture provides the means to accurately control cooking liquor to chip mass ratio for improved digester operation. When applied to monitor biomass moisture, better boiler efficiency is enabled by the continuous indication of heating value to optimise fuel feeding control and supplementary fuel use.



Valmet Chip 'n' Bark Moisture Analyser

Improved process performance by innovative analyser

Valmet CBA replaces time consuming oven dry laboratory measurements by utilising microwave technology to continuously measure chip, bark, forest residue biomass or recycled wood moisture. A sample flow is taken from the conveyer chute, pushed through the unobstructed measurement chamber and then returned to the chute. Disturbances that affect conveyor mounted instruments have been eliminated with the innovative design and measurement concept.

"As chip and biomass moisture have such a great effect on productivity and efficiency, the continuous measurement provided by Valmet CBA can be effectively used in real time control and provide a rapid return on investment. Together with Valmet's other successful analysers and controls, it is another tool for the complete optimization of the pulp mill and power plant," says Antti Kokkonen, product manager, Automation business line, Valmet.

Robust, continuous measurement of wood chip or biomass moisture from 0 to 70%

The robust construction of Valmet CBA, equipped with an integral screw feed sampling unit, is designed for trouble free and straightforward installation. A combination of microwave resonance, Q-value and sample temperature is used to accurately measure moisture content from 0 to 70% and optional heated screw tubes are available where the possibility of ice or frozen material exists. With Industrial Internet functionality, measurement data, alarms and diagnostics are all remotely accessible. Not requiring any special certification or safety procedures, Valmet CBA is applicable to all wood species and forest biomass moisture measurements.

ANDRITZ successfully rebuilds sludge screw press at Stora Enso Anjala

ANDRITZ has successfully completed the rebuild of a sludge screw press at Stora Enso's Anjala paper mill in Anjalankoski, Finland. The turnkey upgrade of the press, which has been out of operation for the past few years, included dismantling of the baskets and shaft, rebuild of the baskets with new screen plates, overhaul of the counter-pressure unit, supply of all parts needed for the overhaul, as well as erection of the unit.

The upgraded press replaced an existing, outdated sludge dewatering unit. Prior to award of the order, intensive laboratory sludge tests were conducted by ANDRITZ in order to check the suitability of the screw press for the dewatering capacity needed and the sludge to be processed.

Valmet to supply a defibrator system to Luso Finsa in Portugal

In 2006, the very first EVO-56 defibrator system developed by Valmet was installed at Padron mill of the Finsa Group in Spain. This year, Luso Finsa in Portgual has ordered the same system for its fibreboard production plant. The system is scheduled to be delivered in the second quarter of 2017.

The defibrator system is a Valmet EVO-56 type for 25 tonnes per hour of medium density fibreboard. Among its many benefits, the EVO system boasts lowest electrical, steam, resin and water consumption for any given fibre quality.

"As we have had an EVO-56 defibrator for ten years we know that the system works well and it was natural to choose the same system also in this new project. The operational cost of the system is low and Valmet was able to handle the short delivery time we needed," says Manuel Mera Franqueiro, Technical Manager at Finsa.

"Finsa Group was the first customer to purchase our new EVO concept when we released it ten years ago. The now received repeat order is a proof of the customer satisfaction," says Jan Laredius, Senior Product Manager at Valmet.

Archroma extends tetrasulfonated optical brightening agents capacity in Europe

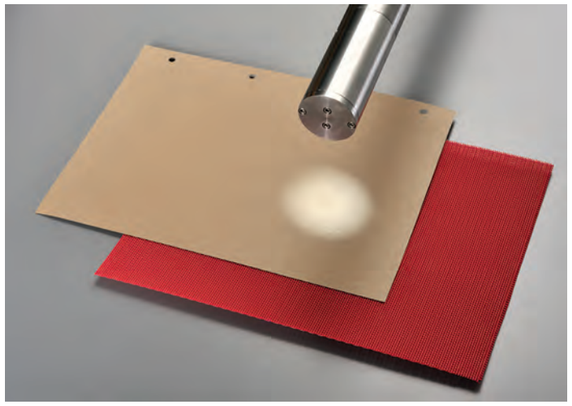
Colour and speciality chemicals producer Archroma will invest in a new production facility for tetrasulfonated optical brightening agents (OBAs) at its existing production site in Prat del Llobregat, Spain. The investment will extend its production capacities primarily to serve demand in Europe and provide a platform for future innovations to be introduced in sustainable whiteness solutions.

Tetrasulfonated OBAs – the most commonly used optical brightening agents in papermaking – are suitable for use in all parts of the machine and production process, an aspect that is valued by customers requiring a versatile product or those with limited storage facilities. The new capacity is expected to come on stream by mid-May 2017.

WSM Pin Chipper expands fibre supply, reduces fibre cost

The new WSM Pin Chipper™ by West Salem Machinery is a high capacity fibre preparation machine that converts lower value mill residuals (shavings and hogged wood) and alternate fibre supply sources into a high percentage of pin chips with long fibre length for use in the pulp and paper industry.

Available in rotor diameters of 42", 48" and 60" and rotor lengths from 36" to 88", it typically operates with 200 – 800 HP. The modular and adjustable tooling includes either rigid or swing hammers with replaceable tips, combined with modular sizing screens allow adjustment to product sizing. Field proven performance at rates up to 75 tonnes per hour, and when combined with a WSM pre-screen, the processing rate is confirmed at rates of over 150 tonnes per hour. System integration into the woodyard is not a problem as WSM offers complete infeed and outfeed options to help supplement the chip supply with lower cost fibre from the chipper.



LEFT With WebDetect-nx, Voith has developed a new solution that identifies web breaks in paper production in a more reliable and fail-safe manner. **RIGHT** The spectroscopic process takes account of the special optical characteristics of the paper web and dryer fabric.

WebDetect-nx reliably protects against machine damage

Voith presents dependable web break detection with innovative multi-light sensor measuring process

Voith has developed a new solution that identifies web breaks in paper production in a more reliable and fail-safe manner. WebDetect-nx is based on an innovative measuring process whereby a multi-light sensor measures different light sources in the visible and infrared light frequency range and interprets the measurements simultaneously at high speed. This prevents potential impairment of the measuring result to allow reliable detection of faults, which subsequently results in fewer false positives, less production downtime as well as a lower risk of machine damage due to undetected breaks.

WebDetect-nx solves the typical problems associated with previous web break detectors based on infrared light and standard sensors. For example, if the contrast between paper web and dryer fabric or basis weight is too low or the moisture content of the paper too high, older methods tend to trigger false positives. This in turn leads to frequent production downtime or even damage to the paper machine.

False positives - negative

The new solution from Voith prevents false positives due to a much more precise identification of web breaks. The greater accuracy is based on an innovative measuring principle, in which light beams of varying wavelengths are projected onto the web simultaneously. The spectroscopic process takes account of the special optical characteristics of the paper web and dryer fabric. The system measures the reflectivity and processes the measurement using a microchip. It also compensates for extraneous light effects, filters the signal, accurately calculates trigger thresholds and adjusts them continuously. Thanks to the chip-supported processing, the measuring signal is more accurate, which leads to fewer breaks and the downtimes associated with them.

"Errors in break detection often cause unnecessary interruptions in paper production and can even lead to machine damage – in either case these downtimes cost paper manufacturers time and money," says Peter Biener, Product Manager at Voith. "WebDetect-nx allows much more accurate and therefore more reliable detection. It also simplifies operation and maintenance of the system thanks to the digital interfaces. As a result, paper manufacturers can achieve higher and more efficient paper production."

Simple operation with Papermaking 4.0

WebDetect-nx features interfaces like Profibus, Modbus-TCP or Standard I/O for simple access via the process control system, on which measuring processes can be visualized and the break sensors controlled interactively. Using programmable logic controller (PLC) function modules, the WebDetect-nx from Voith can be easily integrated into the Machine Control System (MCS) and therefore operated fully automatically. The technology is one of Voith's innovations from its Papermaking 4.0 concept that allows papermakers to take a significant step towards the Smart Factory. During startup, customers can also set specific parameters conveniently via the system's user interface. A suitable interface is also available for this process. Only the sensor measuring head requires mechanical adjustment.

WebDetect-nx also features an improved purging air system, which ensures that the sensor optics stay clean longer and rarely need maintenance. Moreover, the diagnostics system automatically notifies the need for maintenance and thus ensures more efficient servicing intervals. Voith offers WebDetect-nx as a complete package; automation experts from Voith take care of system integration, engineering and documentation of all hardware and software components, and also commission the system.

PAPER AND BOARD

BillerudKorsnäs's mill in Gruvön, Sweden

Hat-trick for Voith
– three orders from BillerudKorsnäs

Voith has received three orders this quarter from BillerudKorsnäs. The first was for a 550,000 tonnes per year board machine for its mill in Gruvön, Sweden. The second two, announced in February, include the rebuild of the existing PM7 in Skärblacka, Sweden; and the relocation of PM7 from Tervasaari, Finland to Sweden. The relocated production line will become the PM10 at the Skärblacka mill.

The Gruvön order comprises a fully equipped XcelLine board machine with a design speed of 1,200m/min and a wire width of 8,800mm producing liquid packaging board, carton board, food service board and white kraft liner. It will be one of the largest board machines of its kind.The scope of delivery includes a three-ply wire section including a Duo DII hybrid former, equipped with two state of the art DuoShake units, a Tandem NipcoFlex shoe press with SolarPress roll cover and drying section equipped with EvoDry steel cylinders as well as multiple coating and calendering stations and a VariFlex L winding unit.

A core part of the delivery will be the Papermaking 4.0 features OnEfficiency Forming and OnCare which will give full online control of all process data. With the OnEfficiency Forming, dewatering, retention and flocculation are stabilized and coordinated at the same time. The OnCare package ensures efficient maintenance of the entire paper machine. Beside the delivery Voith will provide a new level of training for the operators and the maintenance teams.

Start-up of this new production line is queued for the first quarter of 2019.

Voith will equip the 'new' PM10 in Skärblacka with a film press unit

From Tervasaari to Skärblacka

Voith will equip the 'new' PM10 in Skärblacka with a film press unit for surface treatment of the machine glazed (MG) papers. PM10 will be enhanced with a steam-heated hot air dryer for contactless drying following the surface treatment as well as a drying-hood in the new after-dryer section.

The relocation of the production line for MG paper from Tervasaari to Skärblacka will be project managed by Voith. They will also be responsible for entire logistics, basic and detail engineering and disassembly, installation and commissioning of the production line. Voith will carry out a safety audit on the existing machine, prepare a master plan for preserving and repairing parts to be moved and refurbish corroded components.

Voith will also deliver a new soft calender and steam box for PM10.

ANDRITZ to convert paper machine and supply new stock preparation line for Burgo Avezzano in Italy

Italian Burgo Group has tasked ANDRITZ with the rebuild and conversion of Avezzano mill's PM2, a printing and white writing paper machine, as well as its approach system into a modern brown packaging paper machine.

This will bring PM2's annual production capacity to over 200,000 tonnes, operating with a design speed of 1,200m/min and a paper width at reel of 5,340mm. The machine will produce corrugating medium and two-ply testliner with a basis weight range of 80-170gsm for the production of containerboard. The raw material is recycled OCC and mixed waste paper.

A new stock preparation line with a design capacity of 700bdmt/d will also be installed. The line comprises a pulping system with FiberSolve FSR pulper, cleaning, screening, fractionation, and thickening, as well as a reject handling system. The existing approach flow system will be rebuilt, and a new ShortFlow deaeration system will be installed.

ANDRITZ's scope of supply further includes a new PrimeFlow SW headbox for the top-ply and a new PrimeForm SW top former, as well as elongation of the bottom Fourdrinier. The pre-dryer and after-dryer sections will be equipped with PrimeRun web stabilizers for the single- and double-tier dryer groups to optimise the runability of the machine.

A PrimeAir Glide air turn will also be installed after the existing film press. In order to reach the maximum drying capacity needed to achieve the new production targets ten new PrimeDry Steel cylinders will be added to extend the after-dryer section.

The scope of supply also includes basic engineering, erection supervision, start-up, commissioning, and training for the entire equipment supplied by ANDRITZ.

Start-up is scheduled for the end of 2017.

Mondi Group acquires flexible packaging producer Excelsior Technologies

Mondi Group has acquired 100% of the outstanding share capital of Excelsior Technologies Limited from funds managed by Endless LLP and certain other minority shareholders, for a total consideration of £33 million (€38 million), on a debt and cash-free basis.

Excelsior is a vertically integrated producer of innovative flexible packaging solutions, mainly for food applications, with a unique packaging technology for microwave steam cooking. With two plants, located in Deeside (Northern Wales, UK) and Nelson (Lancashire, UK) the Excelsior serves both domestic and US customers.

Commenting on the acquisition, David Hathorn, chief executive of Mondi Group, said: "The acquisition of Excelsior supports the development of our Consumer Packaging business in high growth product applications. Its leading microwave steam cooking packaging technology complements and enhances our global food packaging offering."

Stora Enso invests EUR 28 million in Heinola Fluting to improve production performance

Stora Enso will be investing EUR 28 million at its Heinola Fluting Mill in Finland, to improve quality as well as increase production capacity of its AvantFlute SC product portfolio. AvantFlute SC is semi-chemical fluting made from virgin fibre and is developed especially to endure demanding packaging requirements.

The production capacity of AvantFlute SC will increase by 15,000 tonnes once the investment is completed and fully implemented. The current annual production capacity at Heinola Fluting Mill is 300,000 tonnes of fluting.

TISSUE

Toscotec ships biggest steel Yankee dryer

In mid December, Toscotec shipped the first two of its Steel Yankee Dryers (TT SYD) from the port of Marina di Carrara, Tuscany. With diameters of 6,7m (22 feet), they are the largest of their kind in the world.

The TT SYD-22FT is at the core of the company's PRODERGY tissue machine, which is equipped with a Steam Hood to achieve the maximum operating speed of 2,000m/min.

The TT SYD is produced at a dedicated facility in Massa, 50km from Lucca, a location chosen for its easy seaport access for quick overseas shipments. The architectural heart of the facility is the central hall that houses all the stages of the production line: 180m long, 40m wide overall and up to 18m high.

From metalworking and precision mechanical processing to thermal treatment in a 10m x 10m oven, all the tests and stamps are made on site according to European (PED), American (ASME), Chinese (CSEI) and Japanese (JIS) regulations. The new centre also houses technical and production offices, as well as a conference room and lounge for customers.

According to Toscotec, the new centre marks a breakthrough in Steel Yankee Dryer manufacturing.

Successful start-up by A.Celli Paper at Sofidel UK Lancaster

In January this year, A.Celli Paper started up a new tissue rewinder at Italian tissue makers Sofidel's UK facility in Lancaster. It took as little as eight months for the machine – a rewinder Mod. 865 shafted in a 3,400mm format – to be built, installed and started up to full satisfaction.

INTERNATIONAL RECYCLING NEWS

ANDRITZ acquires Franssons Recycling Machines

ANDRITZ has acquired technology and intellectual property assets from Swedish Franssons Recycling Machines AB, which manufactures machinery for treating waste, wood, and biomass as well as for recycling plastic, paper, and cardboard.

Franssons has been an established und experienced supplier of industrial shredding and recycling technologies for 70 years, working around the globe. The product and solution portfolio will be absorbed into ANDRITZ's Recycling product group (part of the Pulping and Fibre Systems Division, Pulp & Paper business area).

This further complements its product offerings in recycling, which extend from refrigerator and electronic waste recycling to reject systems for the pulp and paper industry. ANDRITZ is thus able to provide its customers with even more comprehensive solutions and services in the recycling sector.

NAF

V-Port Ball Sector Rotary Control Valve

The NAF-Setball SF is designed for modulating control providing excellent equal percentage flow characteristics. It's compact size, and short face-to-face dimensions significantly reduce weight making it a cost effective choice. Together with it's high flow capacity it is highly versatile and an ideal solution for a range of general control applications including erosive media such as pulp, fibres or slurries.

They are in stock – Call us today!

NAF-Setball SF Control Valve provides:

- Sizes from 1" (DN25) to 10" (DN250)
- Pressure class PN40 / ANSI 300
- Temperatures up to 250°C
- Direct actuator mounting with no brackets
- One-piece leak-proof stainless steel body
- Spring loaded stem seal packing
- Metal seats with welded Alloy 6 overlay
- Low friction bearings for smooth operation

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