SILICA SOL CHEMISTRY
Could this highly developed chemistry be a “fit” on a board machine in your mill?

MARKET PULP
Demand and prices posted solid gains in 2013. To what extent will new capacity, world economies and China affect the market in 2014?
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While the picture remains a bit fuzzy for next year and differs considerably for short vs. long fiber grades 2013 was without doubt a decent year for market pulp overall. NBSK prices posted solid gains and the market ended the year on an upswing. The main questions for 2014 are new capacity, global economic strength and demand by China.

20 Heads-Up: Mega-merger? . . . or not?
It’s been a very difficult year for Europe’s paper industry; especially from a “people” standpoint. But in the wake of blood, sweat and tears from the painful cuts to capacity and jobs, third quarter 2013 results have showed signs of bottom line improvement over 2012. Never the less, more is in store, and UPM and Stora Enso could make the biggest impact yet.

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Pulp Friction

By John O’Brien, Managing Editor
jobrien@paperage.com

Last December, seven Chinese companies — five pulp producers, a textile company, and a cotton processor — petitioned China’s Ministry of Commerce (MOFCOM) requesting an antidumping investigation on “Cellulose Pulp” originating in the United States, Canada, and Brazil.

On February 26 of this year, MOFCOM began the requested antidumping investigation with the “period of investigation” for dumping from January 1, 2010 through December 31, 2012, while the “injury” investigation period from January 1, 2010 through December 31, 2012.

It’s important to note that what MOFCOM refers to as cellulose pulp is more commonly known as dissolving pulp. It’s also important to note there are two distinct grades of dissolving pulp: specialty grade dissolving pulp and commodity dissolving pulp. End-uses of the two grades differ greatly, and it’s the commodity grade of dissolving pulp, which is used for the production of viscose fiber primarily used in the textile industry, that MOFCOM is investigating.

The guts of the case stem from a surge in demand and uncharacteristically high pricing for dissolving pulp in 2011 due to a shortage of cotton, which is also a primary input material for the textile industry. As the supply/demand scenario of cotton returned to more normal levels in 2012, demand for dissolving pulp declined, leading to overcapacity and a sharp drop-off in price.

It’s worth mentioning that areas in the world with abundant forestlands can produce dissolving pulp at much less cost than, say, a country like tree-challenged China. This is due to the large amount of wood required to produce each tonne of dissolving pulp. So in essence, the US, Canada, and Brazil are low cost producers and China opts to take protectionist measures.

Canadian economist Michael Stone authored a very good report that breaks down why, on the surface, MOFCOM might assume the price of some imports of dissolving pulp appear too low and could be considered dumping by American, Canadian, or Brazilian dissolving pulp producers.

“In 2011, the price for cotton spiked due to temporary changes in the supply of cotton which, in turn, caused the price for commodity dissolving pulp to spike. This was a temporary occurrence, and not reflective of the real long-term price for commodity dissolving pulp,” Stone explained.

“In response to this price spike for commodity dissolving pulp, global dissolving pulp capacity rapidly increased, primarily in China. As a result, when commodity dissolving pulp prices dropped as cotton prices normalized, China’s dissolving pulp producers were no longer competitive due to over capacity and a high-cost structure caused primarily by their reliance on wood fiber imports,” Stone concluded.

According to UN FAO statistics, in 2012, South Africa was the largest net exporter of dissolving pulp (705,000 tonnes), followed by Canada (676,861), the US (405,363), Brazil (390,600), and Sweden (375,987). These are the world’s major dissolving pulp exporters. The figures do not represent the total tonnage of dissolving pulp imported by China. But, in 2012 China was a net importer at 1,681,588 tonnes, which is about 65% of the dissolving pulp exported by the major producing countries.

Obviously China doesn’t produce nearly enough dissolving pulp to satisfy its own textile industry. So where’s the problem?

Apparently, MOFCOM is going by the book on this one: Under international trade rules, dumping refers to selling exported goods below prices in the producer’s home market. Under WTO rules, duties can be applied by importing countries if the dumping is harming their domestic producers.

Imports of lower priced dissolving pulp may be difficult for a small number of Chinese producers to compete against, but in this case MOFCOM may want to take a lesson from Captain Kirk and Mr. Spock in what is referred to as “Spock Logic”:

“The needs of the many, outweigh the needs of the few; or the one.”

MOFCOM’s final decision is slated for February 2014, and if the Ministry has a few Star Trek fans onboard, the investigation may clear up without a hitch.

Have a safe and happy holiday season, and a great start to the New Year! ■
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Wausau Paper Starts Up New ATMOS Tissue Machine

Voith said that Wausau Paper recently started up a new Voith-supplied tissue machine that was installed at Wausau’s paper mill in Harrodsburg, Kentucky.

According to Voith, the new machine is designed to operate in conventional Crescent Former mode and in ATMOS mode and will enable Wausau to increase its installed tissue production capacity.

“The main highlight of this double-width (5,600 mm) machine is the use of ATMOS technology, which was developed in Voith’s Innovation Center in Sao Paulo, Brazil. This technology enables the production of premium and ultra-premium tissue papers using up to 100% recycled fiber, and consumes up to 60% less energy when compared to similar existing technologies,” Voith Paper said in a statement.

Rogerio Berardi, Global Vice President – Tissue Product Management at Voith Paper, added, “Developed in a joint effort with Wausau Paper, this project is very important strategically for both companies, since the American market is the world’s largest premium and ultra-premium tissue and towel paper consumer.”

CNG Acquires Bradner Central’s U.S. Distribution Business

Central National-Gottesman (CNG) in mid-November signed an agreement for its Lindenmeyer Munroe division to acquire the assets and business of Bradner Central Company, one of the oldest and most highly regarded family-owned paper merchants in the United States.

Financial terms of the deal were not disclosed.

Bradner is headquartered in Elk Grove Village, Illinois (Bradner Smith; Rotary Paper Manifold) with operations in Butler and Appleton, Wisconsin (Bradner Smith); Ann Arbor and Grand Rapids, Michigan (Quimby Walstrom); Dallas, Texas (Alto Papers) and Atlanta, Georgia (Bradner National).

“Bradner Central was founded in 1852 in Chicago and remains majority-owned by descendants of the founding families. We have known the owners and senior management of Bradner for many years and have the utmost respect for the quality of the Bradner organization and its people,” said Ken Wallach, Chairman and CEO of CNG.

“This transaction gives us a unique opportunity to strengthen our presence in the Midwest by combining the successful Bradner operations in Illinois and Wisconsin with our existing Lindenmeyer Munroe facilities in those states, and provides us with our first presence in the large Michigan market,” he added.
A new company is born

At the turn of the year Metso’s Pulp, Paper and Power businesses will become an independent, listed company – Valmet Corporation.

Valmet will focus on delivering competitive technologies and services globally, especially to industries that use bio-based raw materials. The new company is strongly committed to moving its customers’ performance forward.

Metso will continue to provide leading process automation and flow control solutions and services for the pulp, paper and power generation industries. Metso and Valmet will work closely together to offer winning automation solutions and services boosting their customers’ production efficiency.

Discover more at www.valmet.com and www.metso.com
**Pratt Industries to Build New Recycled Paperboard Mill in Indiana**

Pratt Industries announced plans to build its fourth, 100 percent recycled paper mill — eventually bringing the company’s overall containerboard capacity to 1.5 million tons.

The new $260 million mill will be located in Valparaiso, Indiana, adjacent to the company’s existing box-making plant which is the world’s largest.

Chairman and owner Anthony Pratt said construction would begin in March, next year, and be completed by July, 2015.

“This new facility will allow us to better service the needs of our expanding customer base not only in the Midwest, but throughout the United States,” Pratt said. “And Indiana is a perfect fit for us. We’ve been a part of the business community here for many years now and we know there is a skilled, reliable workforce available to us.”

The mill will occupy a new 250,000 square-foot building on a 50-acre site. It will include a wastewater pre-treatment facility and road improvements. When it reaches full capacity, the new facility will produce 360,000 tons of recycled paperboard per year.

Pratt expects the new mill will eventually employ more than 100 people. The company currently employs more than 300 at the box plant. It expects to begin hiring paper machine operators, equipment operators, electrical and instrumentation technicians, shipping representatives, waste yard personnel, shift supervisors and maintenance associates late next year.

**Sappi Fine Paper NA Completes Conversion Project at Cloquet Mill**

Sappi Fine Paper North America successfully completed its US$170 million capital conversion project at the Cloquet Mill in Minnesota to produce Specialised Cellulose, which is used in textile and consumer goods markets.

The conversion initiated in 2011, was accomplished on time, within budget, and safely, Sappi said.

“Sappi’s investment in the Cloquet Mill reinforces our position as a worldwide leader in the Specialised Cellulose market, demonstrating our reputation of reliability and technical know-how,” said Mark Gardner, President and Chief Executive Officer, Sappi Fine Paper North America.

Sappi is currently the largest manufacturer of Specialised Cellulose in the world with capacity totaling to over 1.3 million metric tons per year.

The company now has the capability to produce Specialised Cellulose on two continents including its South Africa expansion at the Sappi Ngodwana Mill and its Saiccor Mill in KwaZulu-Natal. With the Cloquet conversion completed, the mill’s Specialised Cellulose production is 330,000 metric tons per year.

In the first two weeks of the start-up curve, average production was between 500-600 tons to over 1,000 tons produced per day as ramp up continued into July. Product output has exceeded quality targets and the production capacity is currently fully-secured to fulfill customer orders, Sappi said.

**Paper Industry Veteran Joe Raccuia Buys New York-based Tissue Converter Morcon**

Morcon, Inc. announced the sale of its business to longtime paper industry executive Joseph F. Raccuia. The company operates two tissue, towel and napkin converting facilities — one in Upstate New York and the other in South Carolina.

Terms of the deal were not disclosed.

Raccuia is the former president and CEO of SCA Tissue North America and former president and CEO of uncoated printing paper manufacturer Finch Paper LLC.

Morcon serves the Away-From-Home commercial, food service, healthcare and industrial markets. The company employs 120 people at its SC location and 85 people in Cambridge, New York, where the business is also headquartered.

“Morcon is a very well-run, successful and growing business,” Raccuia said. “I’m looking forward to continuing this momentum, and working with Morcon’s employees to take the business to even greater levels of success.”

Raccuia said Morcon’s two locations are strategically located to service the eastern U.S. and key portions of the Midwest, although there are customers nationwide. His long-term plans envision additional locations to grow business in the central and western parts of the country.

“I know where I want to take this business, but to get there I have to draw on others’ expertise and ideas, and that includes our employees, customers and suppliers,” Raccuia said.

The founder, president and CEO of Morcon, Wayne R. Morris, who established the business in 1987, said, “Morcon has been my family’s life for nearly three decades, but now is the right time for me to move.”

Raccuia served as president and CEO of SCA Tissue North America from November 2001 through April 2008. He then joined Finch Paper in February 2009, where he served as president and CEO until stepping down on May 24 of this year.
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Mac Papers Completes Acquisition of Alles Inc.

Mac Papers on Nov. 1 completed its acquisition of Alles Inc., a full-scale distributor of packaging products, systems and services out of Hialeah, Florida.

Terms of the deal were not disclosed.

The acquisition is Mac Papers’ largest to-date outside of its printing paper business. The company said the deal signifies its “commitment to diversifying its core business offering and becoming a key player in packaging distribution.”

“When Mac Papers opened its doors in 1965, we used to say ‘paper is all we do.’ A lot has changed in nearly 50 years,” said Sutton McGehee, Chairman and CEO of Mac Papers.

While we aim to be the most valued and respected paper distributor, we’re diversifying our core business to be sustainable in a declining paper market. This strategic acquisition underscores our commitment to becoming a bigger player in the packaging industry by combining our strong product and distribution expertise with Alles’ geographical footprint and increased scope of services,” McGehee said.

The Alles footprint includes offices and distribution centers in Tampa and Jacksonville, Florida, as well as Louisville, Kentucky, a new location that furthers Mac Papers’ footprint across the Southeast.

According to Mac Papers, Alles will continue operations out of its facilities for the first 30-60 days, until it moves into Mac Papers warehouse locations in those regions. The Louisville facility will continue to operate as is.

The deal follows Mac Papers December 2012 acquisition of All Packaging Supplies, a distributor of industrial and food service packaging supplies located in Pembroke Park, Florida. Mac Papers also acquired Orlando, Florida-based Redd Paper Company in Nov. 2011, which included packaging and wide format printing divisions.

Southworth Renames Specialty Paper Division, Paperlogic

Southworth Company recently renamed its specialty and technical paper division, Paperlogic.

According to Southworth, Paperlogic’s focus is on the expanding specialty paper needs of industrial and commercial customers in the medical, agricultural, food service, automotive and home decor industries, among others.

H.H. “Brub” Collina has been named Executive Vice President of Paperlogic.

“The decision to rename the commercial division Paperlogic was a direct result of our successes launching new products and applications,” said Collina. “Our goal with Paperlogic is to continue focusing on the R&D and product development required to keep Paperlogic at the forefront of the specialty technical paper industry.”

Uruguay Government OK’s Production Hike for UPM’s Frey Bentos Pulp Mill

UPM said that the State of Uruguay has granted permission for the company to increase the annual production of the Frey Bentos pulp mill from the current 1.1 million to 1.2 million tonnes.

“The decision demonstrates the State of Uruguay’s continuing support to the development of the forestry sector in Uruguay,” said Jaakko Sarantola, Senior Vice President of UPM’s Pulp Business.

However, neighboring Argentina has for years alleged that the mill pollutes the Uruguay River, which separates the two countries.

“It is lamentable that the interests of UPM are so powerful that they have turned into the factor that determines the relationship between Uruguay and Argentina,” said Argentine Foreign Minister Hector Timerman.

UPM-Kymmene had requested permission to increase pulp production at the mill by an additional 200,000 tons per year, but the Uruguayan government granted permission for only half of the amount.

“We have authorized an increase of half of what they asked for,” Uruguayan President Jose Mujica said, adding that his decision was “provisional” and subject to UPM-Kymmene’s compliance with environmental standards.

“The permanence of this decision depends on the level of compliance,” Mujica said. “We are conscious that we have to care for the environment.”

According to UPM, the production increase can be take place without additional investments in the production processes. However, UPM plans to invest in a cooling system for the mill’s effluent water.

“The productivity has increased as a result of focused and professional work of the Uruguayan team throughout the whole forestry value chain,” Sarantola said. “Since the start-up of the operations, the mill’s environmental performance has been excellent and UPM continues respecting the authorized permit limits.”

The Frey Bentos mill started up in November of 2007 and produces bleached hardwood eucalyptus pulp. The mill is located on the banks of the River Uruguay, four kilometers east of the city of Fray Bentos.
EUROPE

UPM and Canfor Team Up in Global Market Pulp Sales Deal

Finland’s UPM-Kymmene Corp. and Canada’s Canfor Pulp Products announced an agreement of a strategic sales and marketing cooperation. Beginning Jan. 1, 2014, UPM’s Pulp Sales network will represent and co-market Canfor Pulp in Europe and China while Canfor Pulp’s sales network will represent and co-market UPM Pulp in North America and Japan.

In the initial phase, the cooperation agreement will include six grades of market pulp and approximately one million tonnes of pulp sales from eight mills on three continents.

Customers of both companies will be offered a broader product portfolio consisting of: Premium Reinforcing Northern Bleached Softwood Kraft (PRP NBSK), Northern Bleached Softwood Kraft (NBSK), Northern Bleached Birch Kraft (NBBK), Bleached Eucalyptus Kraft (BEK), Unbleached Electrical Kraft Pulp (UBE), and Bleached Chemical Thermo Mechanical Pulp (BCTMP).

Hamburger Rieger to Invest EUR 18 Million on Paper Machine Conversion

Hamburger Rieger plans to invest EUR 18 million to convert Paper Machine 1 in its Spremberg mill in Eastern Germany for the production of Coated White Top Testliner (containerboard).

The conversion of PM 1 will be carried out towards the end of 2014, with a start-up expected at the beginning of 2015, the company said.

Upon completion of the machine project, the Spremberg mill will have the capability to produce coated testliners in widths up to 280 cm.

The investment is part of Hamburger Containerboard’s strategy to expand its total production potential in the “White” market (White Top Testliner, coated and uncoated) in the medium-term from its current annual capacity of 450,000 tons to 750,000 tons.

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EUROPE

Sappi Slates EUR 120 Million for Upgrade and Energy Projects at Two Graphic Paper Mills in Europe

Sappi Fine Paper Europe has confirmed investment plans over the next three years amounting to approximately EUR 120 million for its two leading coated graphic paper mills which will significantly reduce the cost base and improve the profitability of the two mills.

For the Sappi Gratkorn Mill in Austria, the investment will focus on upgrading pulp production facilities, as well as papermaking capabilities. Gratkorn currently produces almost one million tons of coated woodfree paper per year. The investment is aimed at securing sustained cost reductions, increased flexibility in production and further improved profitability rather than at increasing capacity.

The investment in Sappi’s Kirkniemi Mill in Finland, one of Europe’s largest and most modern coated magazine paper mills, involves the construction of a new power plant on the mill site, significantly improving cost competitiveness and profitability.

Berry Wiersum, CEO Sappi Fine Paper Europe, said, “Despite a tough environment we are making progress with the necessary transition work identified to strengthen the company and improve our profitability into the future. We are optimistic about our Gratkorn and Kirkniemi investments and look forward to the benefits that they will return to the company in the coming years.”

The Gratkorn mill has the annual capacity to produce 950,000 tons of high quality double and triple coated papers. The mill also produces 250,000 tons of totally chlorine free (TCF) chemical pulp. The mill employs 1300 people. About 95% of the mill’s production is exported.

The Kirkniemi mill has the annual capacity to produce 735,000 tons of high quality magazine papers. The mill employs 600 people. Over 90% of the mill’s production is exported.

Rottneros Relocating Headquarters from Stockholm to Vallvik Mill

Rottneros Group has begun the process of moving its head office from Stockholm to Vallvik Mill (Sweden), one of the group’s two pulp mills.

“In our latest interim report, we advised of the change process recently initiated within the Group,” said Carl-Johan Jonsson, President and CEO of Rottneros.

“I consider that it is vital for Group management to be closer to our operations and consequently feel that our decision to relocate our head office to Vallvik Mill as part of this change process represents a logical step,” Jonsson explained.

Rottneros produces market pulp and has an annual production capacity of just under 400,000 tonnes produced at two mills in Sweden.

UPM Plans to Sell Paper Machine 4 in Ettringen Mill

UPM has signed a letter of intent with a newly formed company, Aviretta, for the sale of the paper machine 4 at UPM Ettringen in Germany.

According to UPM, Aviretta GmbH plans to purchase PM 4 and to convert it into a board machine with a planned production capacity of approximately 210,000 tonnes per year. The machine would remain in the Ettringen mill, and under the terms of the deal UPM Ettringen would render certain services to Aviretta.

UPM would not be a shareholder in this company.

“We are pleased about the plans of Aviretta to convert paper machine 4 into a board machine. This setup would also lead to synergies for both contract parties,” said Winfried Schaur, General Manager of UPM Schongau & UPM Ettringen. “A thorough examination in [November] will show whether the planned project could be realized in this form.”

In April 2013 UPM announced the permanent closure of the PM 4 citing continuing challenges in the European economy having a significant impact on the consumption of graphic papers.
EUROPE

**Metsa Tissue Inaugurates Krapkowice Mill after EUR 55 Upgrade**

Metsa Tissue in October inaugurated its paper mill in Krapkowice, Poland after an EUR 55 million investment program, which began three years ago and is the largest in Metsa Tissue’s history.

The project included two new, state-of-the-art tissue paper machines, a new away-from-home product converting line as well as extending the converting and warehousing to new, logistically effective facilities.

The investment increases the mill’s tissue production capacity up to 85,000 tonnes per year and converting capacity up to 50,000 tonnes per year.

“"The renewed Krapkowice mill is the most modern tissue facility in Europe,” said Kari Jordan, President and CEO, Metsa Group. “"This investment is strategically important to Metsa Group as it strengthens our market position and competitiveness in the Polish tissue market. “

Metsa Tissue noted that it has reduced the mill’s CO2 emissions by 60%, NOx emissions by over 50% and virtually eliminated SOx emissions. Due to the major improvements in water usage and treatment, the amount of wastewater has been reduced by 42% per cent.

INDUSTRY SUPPLIER

**OASIS Opens New Service Center in California**

OASIS Alignment Services is pleased to announce the opening of a Service Center in Lake Elsinore, California. The new, fully equipped Service Center becomes the main center of operations for OASIS on the West Coast.

“Establishing a service center in California provides customers with increased access to the highest quality 3D metrology, optical alignment and mechanical services available in the industry, with the added benefit of lower mobilization costs,” OASIS said in statement. “With the new location in California, OASIS increases response times and service capabilities to customers in California, Nevada, Utah, Arizona and New Mexico.”

Joel Farnum, West Regional Manager, will oversee the operations of the Lake Elsinore Service Center and the OASIS Satellite Service Center in Vancouver, Washington. Prior to his move to California, Farnum spent eight years as the Regional Manager of the OASIS Midwest Service Centers located in Appleton, Wisconsin and Dayton, Ohio.

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**Paper2014 to be held at the New York Palace Hotel, March 23-25**

The American Forest & Paper Association (AF&PA) and NPTA Alliance announced that Paper2014 will be held at the New York Palace Hotel, March 23-25, 2014.

Paper2014 is the premier annual paper industry business convention, providing leading executives from across the industry with engaging sessions and unparalleled networking opportunities.

The New York Palace, located on Madison Avenue, is newly renovated and will provide a stunning venue for networking in addition to being convenient to Midtown Manhattan restaurants and attractions.

**Paper2014 and the New York Palace offers:**

- Single location for meetings and programming that will maximize networking opportunities
- New for 2014! – Larger Tower Corner suite option is more than twice the size as previous hotels for entertaining up to 50 people.
- Best space, most amenities, with the greatest value for rooms and suites in midtown
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Paper2014 is hosted by the American Forest & Paper Association and NPTA.
**Appleton Coated** announced that John Black has joined the company’s sales management team in the role of Director of Sales and Business Development for the East. Most recently Black served as vice president of sales and operations at New Leaf Paper. In addition, Jean-Pierre (J.P.) Thomas has joined the company as Sales Representative serving the Southern California market. Thomas most recently served as western territory sales manager for Finch Paper.

**Finch Paper** has appointed Gregory Maio as Vice President, Sales and Marketing and a member of the Senior Leadership Team. Maio previously served as Vice President of Sales for National Envelope.

**Mohawk** has named Kevin Richard, formerly Executive Vice President, Operations & Chief Operating Officer, as President of Mohawk Fine Paper Division; and Paul Biesiadecki, previously Executive Vice President, Sales and Marketing, has been named President, Mohawk Digital. The appointments coincide with Mohawk’s recent organizational restructuring, which created two new business units: Mohawk Fine Paper and Mohawk Digital.

**Orchids Paper Products Company** announced that Robert A. Snyder, President, Chief Executive Officer and Director of Orchids, will retire on Dec. 31, 2013. Snyder resigned from the Board of Directors of the company on Nov. 4 and stepped down as President and CEO on Nov. 8. He will continue to serve in an advisory role during a transition period. Jeffrey S. Schoen succeeds Snyder as President and CEO. He has been a Director of Orchids since 2007 and Chairman of the Board since May 2013. On Nov. 4, Schoen resigned from his role as Chairman of the Board, but continues to serve as a Director. Steven R. Berlin succeeds Schoen as the new Chairman of the Board.

**Sappi Fine Paper North America** announced that Rick Dwyer is retiring from his position as Managing Director of the company’s Cloquet Mill in Minnesota, and that Mike Schultz will be assuming the role of Managing Director, Cloquet Mill. Dwyer, who has over 30 years of experience in the paper industry, joined Sappi in 2007 as Managing Director of Sappi’s former Muskegon Mill. Schultz tenure at the Cloquet Mill began over 23 years ago. His background includes a key role in the original capital project to build the Cloquet pulp mill in the 1990s, Pulp Production Manager, and Managing Director. Most recently, he successfully completed the Cloquet Conversion Project as its Managing Director.

**Stora Enso** has appointed Seppo Parvi as its new Chief Financial Officer. He is currently CFO and Executive Vice President, Food and Medical Business Area, at Ahlstrom. Parvi will join Stora Enso during the first quarter of 2014.

**OASIS Alignment Services** announced the appointment of Mike Jenkins to the position of Account Manager for the South Region. Jenkins brings over 10 years of experience in mechanical engineering, sales, customer service, and business development in manufacturing environments. Prior to joining OASIS, Jenkins was Account Manager for Ashland Water Technologies.

**The Association of Independent Printing Paper Merchants** (AIPPM) said that Alain Villemure, Vice President, Sales for Lecta North America, is the recipient of its 2013 Peyton Shaner Award. The Peyton Shaner Award was established to commemorate the founder of the AIPPM. The recipient is recognized as someone who has shared Shaner’s passion for the industry.
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AF&PA Honors Member Company Sustainability Efforts

Ingenuity and hard work have resulted in exemplary sustainability programs and initiatives taking place across the paper and wood products manufacturing industry.

By Donna Harman, AF&PA President & CEO

Five member companies were recognized for their commitment to sustainability through the 2013 AF&PA Sustainability Awards at AF&PA's annual meeting. The awards are part of the paper and wood products manufacturing industry’s sustainability initiative, Better Practices, Better Planet 2020, and are an annual recognition of exemplary industry sustainability programs and initiatives.

AF&PA sustainability award applicants are considered in two categories – “Innovation in Sustainability” and “Leadership in Sustainability.” The five “Leadership” subcategories – Paper Recovery for Recycling, Energy Efficiency/Greenhouse Gas Reduction, Sustainable Forest Management, Safety, and Water – correspond with and support progress toward the Better Practices, Better Planet 2020 sustainability goals. The “Innovation” award category recognizes projects that merit recognition for their contribution to sustainable business practices, but that do not specifically address one of the sustainability goals.

KapStone Paper and Packaging Corporation’s Longview Mill received a “Leadership in Sustainability” Greenhouse Gas Reduction/Energy Efficiency award for the “One-Year Snapshot of Longview’s Multi-Year Journey” project. The mill embarked on a multi-million dollar improvement project that spanned three years, contributing to reduction of greenhouse gas emissions by 72 percent over the last decade; reduction of overall energy use by 37 percent since 2007; reduction of overall energy used per ton of paper produced by 17.6 percent since 2007; and an increase of total tons of paper produced by 50 percent since 2006.

RockTenn was awarded a “Leadership in Sustainability” Paper Recovery for Recycling award for the “RockTenn and Customer Recycling and Waste Reduction Initiative” project. RockTenn partnered with a national customer to educate the company’s team members about an existing recycling program so they would become more conscious of their disposal decisions and divert recyclables from the waste stream. The initiative resulted in 61.6 percent of the customer’s waste stream being recycled in 2012; 80.2 percent of the total recycle stream was composed of paperboard, corrugated and mixed paper.

Domtar was recognized with two “Leadership in Sustainability” awards. First was a Safety award for Domtar’s “Hazard Mapping at Ashdown” project at the Ashdown, Arkansas mill, which began in 2011 and involved specialized training, compiling information, developing electronic symbols and systematic area mapping. Since the program’s
Domtar also received a Sustainable Forest Management award for the company’s “Four States Timberland Owners Association” fiber certification program. Domtar formed the Four States Timberland Owners Association in 2010 to educate landowners and managers on how to obtain sustainable forest management certification. Domtar and 55 individual landowners representing more than 70,000 acres of forestland achieved certification in November 2012. The association is aiming to double the amount of certified acreage in 2013.

Brunswick Cellulose, Inc., a wholly owned subsidiary of Georgia-Pacific LLC, received a “Leadership in Sustainability” Water award for the “Water Use Reduction” project at its cellulose mill in Brunswick, Georgia. Georgia-Pacific installed a single-line bleach plant to replace three older pulp bleaching processes. The upgrade project resulted in a reduction in overall groundwater use of nearly 10 million gallons per day, or 30 percent of the mill’s total daily use, since the new equipment became fully operational in the first quarter of 2012. The project also allows for a smaller energy footprint and lower air emissions from energy production.

Graphic Packaging International was this year’s sole recipient of an “Innovation in Sustainability” award for the for “Tite-Pak® Innovation Beverage Package” project. Tite-Pak® was designed to reduce the amount of glass bottle breakage without increasing total packaging materials. Research indicates that the implementation of Tite-Pak® has led to a 30 percent reduction in greenhouse gas emissions among the 12 and 18 bottle packs. Graphic Packaging promotes a long-term reliance on paperboard packaging instead of plastic through this innovation.

Significant Progress

The winning projects are good indicators of the high bar AF&PA members continue to set for better business practices and are representative of the ingenuity and hard work taking place across the industry, which are key to achieving the industry’s sustainability goals by 2020.

In 2012, AF&PA’s biennial Sustainability Report showed that the U.S. pulp, paper, packaging and wood products manufacturing industry has made significant, measurable progress toward achieving the goals of its Better Practices, Better Planet 2020 sustainability initiative. AF&PA will release its next report in mid-2014.

For more information about the Sustainability Awards program and AF&PA’s Better Practices initiative, visit www.afandpa.org/sustainability.
Stability isn’t normally associated with the paper industry and in particular the pulp segment is often the epitome of a cyclical global commodity. However, for much of 2013 the pulp market has appeared to be relatively stable at least when compared with big market swings caused by upheavals such as the 2008/2009 recession or the 2011 price collapse.

Some of this “stability” is because the world itself is a bit more stable compared to the last couple of years, at least in the major developed economies. The economic and financial problems in Europe have eased, or at the least did not explode as feared into a full blown crisis, and the U.S. economy is boringly grinding ahead at a tepid pace with some bright spots (housing, stocks) along the way. Most projections peg the U.S. economy to improve at a slightly better pace next year, notwithstanding the uncertainty caused by Washington’s inability to function normally. And while problems such as Syria plague the world they remain, so far, localized to a large extent.

Never the less, it’s an improvement over 2012 when global pulp markets reflected weakness due to the ongoing financial crisis in Europe and slowing growth in China, which combined to temper demand for pulp globally. This resulted in 2012 NBSK list prices averaging about $875/tonne or down just over $100 per tonne from peak 2011 levels of over $1,000/tonne. Prices fell even further in Europe and China. The underperforming global economy led to a decline in world printing and writing demand which dropped 1% - 2% vs. 2011 according to various estimates.

Shipments, Pricing Continue Upward Trend

However, not all the news was bad as demand for grades such as tissue, plus some consumer stock building, offset this decline and world pulp shipments last year rose 2.5% to 43.4 million tonnes. Shipments to Europe and North America fell in 2012 but surged 10% to China reaching 10.2 million tonnes. Chinese imports have risen significantly in recent years, except for 2010, when they fell 7.1% from the prior year, and China is now a huge pulp market.

These same overall trends continued in 2013. Global market pulp shipments through the first three quarters of the year are up 2.7% vs. 2012 led by a 3.3% increase in hardwood and a 2.4% rise in softwood shipments. Photo courtesy Metsa Fibre.

Global market pulp shipments through the first three quarters of the year are up 2.7% vs. 2012 led by a 3.3% increase in hardwood and a 2.4% rise in softwood shipments. Photo courtesy Metsa Fibre.

Pulp Mills Hope to Ride Late 2013 Momentum into 2014

While the picture remains a bit fuzzy for next year and differs considerably for short vs. long fiber grades, 2013 was without doubt a decent year for market pulp overall. NBSK prices posted solid gains and the market ended the year on an upswing. The main questions for 2014 are new capacity, global economic strength and demand by China.
second increase in 2013. Coming off the summer, prices were stable during the third quarter of 2013 in all regions of the world, with North American NBSK list prices at US$947. Then a $20/tonne increase was announced for Oct. 1 that raised benchmark NBSK prices to $970/tonne. Prices also increased $20/tonne to Europe. This was quickly followed up in October when NBSK mills announced a second increase of $20/tonne effective Nov.1. The market also supported a $20/tonne increase in China.

What’s Driving Prices?
Several factors are behind the stronger prices including supply issues and inventories. It’s reported that the slow ramp up of BSK capacity at the 720,000 tpy line in Bratsk, Russia was one factor. Chinese paper mills had pulled down inventory in the spring and summer, however, they held off buying pulp so the thinking goes in anticipation of the new tonnage coming on the market at attractive prices. When they had to go elsewhere imports rose and helped lower global stocks.

Supply side issues including downtime problems in North America have also been a factor with unplanned outages reported at Canadian NBSK mills during the third quarter. The shut of 400,000 tpy of Kraft pulp capacity in August in Europe also contributed. Chinese buying picked up recently rising to 1.2 million tonnes in September, up 16% vs. 2012, although this was down from 1.28 million tonnes in August.

These factors resulted in a drop in producer softwood stocks by one day to 27 days of supply in September, with all grades down 4 days due to a 7-day drop in hardwood stocks. The hardwood level of 42 days isn’t considered a tight market, however, despite the big drop.

Nevertheless, it seems that the downward direction of stocks gave momentum to the market and helped drive the recent gains. It should be noted that transaction prices have not increased as much as list prices. In addition, the market for hardwood grades is weaker, owing in part to over supply issues.

A steady shift in pulp consumption patterns in recent years has also had a positive impact. For example, ten years ago printing and writing papers accounted for almost two-thirds of NBSK demand. However, P/W grades now only account for about a third of softwood demand. In contrast, higher growth tissue grades consume almost 40% of demand and the share consumed by specialty papers has risen to about 20%.

Headwinds in 2014?
While in general the news has been good, certainly not all pulp market indicators are positive and there could be some serious headwinds to fight in 2014 to sustain recent gains. For example, North American printing and writing paper demand through September 2013 is running 1.8% below prior year levels and newsprint demand is off 10%. Total U.S. paper and board production through August 2013 was flat vs. 2012, down 0.3%, with paperboard output up 1.9% but offset by a 3.4% decline in paper output. Tissue production was the only paper grade posting an increase, up 4.3% vs. 2012 levels.

Another important concern for next year is the impact of a surge in hardwood market pulp capacity. However, producers are well aware of this and some changes have been made to the timing of some projects. For example, Montes del Plata (Stora/Arauco) in Uruguay (1.3 million tpy BEK) has been delayed until the first quarter of 2014 from an initial target date of third quarter 2013. Other major projects include new capacity at Maranhao (Suzano), Brazil (1.5 million tpy BEK) and Oji Papers’ Nantong City mill in China, a 700,000 tpy hardwood mill.

And these projects come on the heels of the late 2012 startup of what is reported to be the world’s biggest pulp line — the 1.5 million tpy BEK Eldorado Tres Laguas mill in Brazil. It’s possible that almost 4.75 million tpy of hardwood capacity could come on stream in a one year period. Thus, depending on the timing and market conditions the impact could range from minimal to a significant downward pressure on prices.

Looking at 2014 there’s a good chance the softwood market’s momentum will carry into next year. While not universal, many projections indicate the U.S. economy should have a better year in 2014. This may be a big “if” of course, but if Europe also continues to muddle along, overall pulp shipments should post additional gains. This will occur in particular if China continues to restock.

However, there are concerns about the Chinese economy too, which grew “just” 7.7% from a year earlier through the first nine months of 2013, but this would be China’s worst performance in 23 years. This uncertainty makes it hard to predict the level of pulp imports which is a huge swing factor. And as noted, hardwood over capacity, particularly for BEK, is a real concern for BHK mills.

2013 ended up being a better year than many expected, even given some weakness in the global economy. Can 2014 be another good one? ■

Harold Cody is a contributing writer for PaperAge. He can be reached by email at: HCody@paperage.com.
heads up

Mega-merger?...or not?

As of this writing, the speculation about a merger between UPM and Stora Enso is ongoing. The conjecture is mostly fuelled by the Scandinavian financial community. This time last year I reported on the prospects of a mega-merger. My guess is that the two companies will still remain separate but focus on their South American operations, bioenergy and building lumber.

Some industry analysts have suggested that the two companies could merge all or parts of their European graphic paper businesses into a jointly owned vehicle in a cashless merger. But who would be the lead partner? Would it be UPM with 65% ownership? Others suggest more cuts to help stabilize market prices and make life easier for the whole European industry including Holmen (Sweden) Norske Skog (Norway) and Sappi (South Africa).

Karri Rinta, Finnish analyst with Handelsbanken, believes that a joint venture for UPM and Stora is the only way forward.

“The industry has reached a point where it has no choice but to take drastic action, and this joint venture scenario is basically the only way possible to salvage cash flow in the business,” says Rinta. He thinks such a move, followed by more mill closures, would help trim output and costs and let owners focus more on their growth areas like pulp, packaging board and pulp operations in Latin America.

UPM and Stora Enso are similar in their overall “group” of businesses, i.e. they both produce a variety of wood-related products. However, paper remains the biggest business for the two group companies.

UPM Paper has 21 paper mills — Finland (6), Germany (7), the United Kingdom (2), France (2), Austria (1), China (1) and the United States (2) — with a combined annual capacity of about 11.8 million tonnes and sales of EUR 7.2 billion in 2012 or 67 percent of UPM’s business areas sales.

On the other side of the paper-based coin, Stora Enso has 16 mills within its “Printing and Reading” division, mainly in Europe, but with one mill in Brazil and two in China. The division has a combined annual production capacity of about 8.1 million tonnes and sales of EUR 4.8 billion in 2012 or 43% of the group’s sales.

Rinta points out that a joint venture, with a combined 40% of the European market and low debt, would have the muscle to close down several mills totaling up to two million tonnes of annual capacity or 12% of the region’s overall production.
Lending evidence to the process is the impact that recent closures and capacity cuts. Jouko Karvinen, CEO of Stora Enso in his third quarter comment highlighted improved profitability from a year ago despite lower sales that were “compensated by lower fixed and variable costs.”

Jussi Pesonen CEO of UPM was also optimistic about the third quarter. The pulp business had solid results and Chinese operations showed steady profits, while label papers showed actual growth. The company’s pulp mill in Uruguay was permitted to increase production from 1.1 million tpy to 1.2 million tpy. Lastly, in September, UPM took a radical decision to restructure the Helsinki headquarters and move its European and North America (ENA) management to Augsburg, Germany.

On a side note, I asked, as did other analysts, if UPM will be leaving Finland in the long term. I was sent a stiff denial. Yet such a move may still happen because Scandinavian capital cities are very expensive places to reside.

The other European player still trying to find a role is Norske Skog. The company has been taking measures to adjust capacity and possibly its product mix, and generate cash. In late December it will permanently shut down PM 4, a 225,000 tpy lightweight coated paper machine, at its Walsum mill in Germany and has agreed to sell its Singburi newsprint mill in Thailand to a Thai industrial group for a total consideration of USD 33 million. In addition, Norske Skog is converting a newsprint machine at its Boyer mill in Tasmania, Australia to produce lightweight coated grades.

So, the end of term report for Europe in 2013 shows signs of improvement from a “net” result perspective, but all the deep cuts are tough to watch, especially, and sadly, manpower.

David Price is a contributing writer for PaperAge. He can be reached by email at: DPrice1439@aol.com.

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Buckman
Commitment makes the best chemistry.
Anionic nanoparticles are now finding a fit on machine wet ends which historically have suffered from high levels of anionic trash and interfering substances. Could this new highly developed chemistry be a “fit” on a paper machine in your mill?

By Mike Wallace

Fifteen years ago silica nanoparticle usage was restricted to fine paper and bleached solid board grades. Ten years ago nanoparticle systems started to show up in wood-containing mills as they worked to increase ash levels, brightness and quality in order to compete with woodfree sheets.

In the last 5 years the industry has seen a significant increase in silica nanoparticle usage in unbleached packaging grades. New generations of silica sols combined with recent advancements in addition technology have made these highly anionic nano-sized silica dispersions very effective in the challenging wet ends found in brown liner and medium mills.

The purpose of this article is to explain how and why anionic nanoparticles are now finding a fit on machine wet ends which historically have suffered from high levels of anionic trash and interfering substances. At the end of this article there will be several questions. These questions can be used by a mill’s Wet End Manager to determine if these new highly developed nanoparticle chemistries have a fit on his/her paper machine.

To fully understand the many complex interactions which affect the retention and drainage chemistry in the wet end of an unbleached board machine it is best to start off with a basic description of each of the components. These components typically include starch, polymers, wet and dry strengths, alum, PAC and nanoparticles. Retention chemicals help to retain sizing chemicals regardless of the type of sizing agent, so sizing products won’t be discussed in detail.

RETENTION AND DRAINAGE

Starch is a natural polymer used to increase the number of bonds in the board and therefore strength properties. A good starch, which is well-matched to the system, also contributes to fines retention and drainage. There are many sources of starch with the most common sources being potatoes, corn and tapioca roots. The source of the starch and the processing dictates the molecular weight. The nitrogen content of the starch dictates its cationicity level. Often overlooked is the amphoteric nature of the starch. In some wet-ends this is very important. The phosphate level of the natural starch or the added phosphate dictates the amphoteric nature of the starch.

Polymers. In paper mills, the synthetic polymers are often called flocculants or simply the “retention aid.”
There are many types, with the two most common in packaging mills being CPAM (cationic polyacrylamide) and APAM (anionic polyacrylamide). Synthetic polymers (as opposed to natural polymers like starch) are basically chains of individual monomer units linked together in a linear or branched configuration with functional groups located periodically along the chain. The charge of the functional groups can be anionic, cationic or non-ionic. The molecular weight is dictated by the number of monomers linked together. The purpose of the polymer is to bridge between the fibers and fines therefore improving retention and sometimes the dewatering of the stock.

**Wet strength** resins are low molecular weight synthetic polymers. The majority are PAAE (polyamidoamine-epichlorohydrin) -based and are usually highly cationic. Their purpose is self-explanatory as they are used to increase the strength of wet paper.

**Dry strength** resins are more varied in type than wet strength resins. Synthetic dry strength agents used in unbleached packaging mainly include: GPAM (glyoxylated PAM), PVAM (polyvinylamines) and PAM (polyacrylamide). GPAM is always cationic and PVAM is most often cationic. Most PAM’s are also cationic, but anionic versions are available. New and novel cellulose-based dry strengths are also available, but as they don’t have a significant effect on retention and drainage, they will not be discussed here.

**Alum and PAC.** Alum chemistry is complex and only comes into play in rosin sized packaging machines. Alum (aluminum sulfate) is used to create a rosin/aluim complex for sizing. It is important to note that alum is both cationic and acidic and will drive down the wet end pH. PAC is polyaluminum chloride and is also cationic but has less effect on pH than alum. PAC is often used for charge neutralization or to increase ASA performance.

**Nanoparticle.** The two most common types of inorganic drainage aids are bentonite and silica. Bentonite is a crystalline fine grained natural clay and is made up of layered platelets. When hydrated, the particles are amphoteric. Bentonite is commonly not called a nanoparticle but a microparticle as particle size reaches 1 micron. Silica sols are defined as colloidal silica (SiO2) dispersions in which the particles do not settle. Colloidal silica is an amorphous engineered product which is highly anionic. The particles are less than 5 nanometers in diameter and therefore are referred to as nanoparticles. (Note: 1 nanometer = 1 x 10-9 or 0.000000001 meters.)

As illustrated in Figure 2, high molecular weight cationic starch and polymer chains are bridging across the suspensions of anionic fibers and fines. The electrostatic charge attraction is causing the fiber and fines to create large loose water containing flocs. The flocs are then exposed to the highly anionic silica particles. The very tiny silica particles actually enter inside the loose flocs and due to their electrostatic attraction to the cationic starch and polymer strands cause the floc to collapse. It is this collapse of the large loose floc which releases water and creates a smaller denser floc. These “new” flocs retain better, but especially drain better than the original large water-containing floc.

Earlier generation silica sols were designed to react with cationic starch. More recent generations such as Eka NP 2180 from AkzoNobel are designed for polymer containing or even polymer only retention systems.

**NANOPARTICLE SYSTEMS**

Modern world class nanoparticle systems require significant homework to design. The correct combination of polymer, starch (if used), and nanoparticle must be determined with lab scale drainage and retention studies. The selection of polymer, starch and silica for the lab work must first be narrowed down using machine charge and conductivity audits. In addition to determining the correct combination of chemicals, the process feed points make a significant difference and need to be established. Correct feed points depend on the anionic trash and interfering
substance loading of the paper machine as well as the mechanical design of the stock approach system.

Understanding the level of anionic trash and interfering substances is important because selecting the proper cationicity levels of the polymer and starch is dependent on it. One of the first steps AkzoNobel takes when approaching a new machine is to perform a complete charge and conductivity profile. This includes the measurement of colloidal charge (cationic demand), fiber surface charge (zeta potential), and conductivity from the blend chest through to the headbox.

By measuring the charge profile, the effect of the current chemistries added can be quantified as well. A typical profile is seen in Figure 3.

On machines with high conductivity levels such as integrated kraft mills and very closed mills, it is also recommended to do a whitewater elemental analysis to determine the actual cause of the conductivity. See example in Figure 4.

For cost efficiency reasons, the industry trend is to move wet end chemicals closer to the headbox. This is especially true for starch where it is now understood that moving starch into the thinstock from the thickstock does not actually compromise strength. For years both chemical suppliers and machine operators believed it was necessary to add starch back in the thickstock for the best strength results. It was mentioned earlier that a good quality starch contributes to retention and drainage. This effect is much more pronounced if the starch is added to the thinstock. Therefore, by moving starch to the thinstock, mills can lower their retention and drainage chemical spend without compromising strength. This can be a very easy win for the papermill.

However, some paper machines (depending on furnish, sizing agent and charge balance) must be cautious of less starch retention and therefore foam when moving the starch addition point closer to the headbox. The solution is to add a very anionic silica sol. Silica has an electrostatic attraction to cationic starch and therefore increases starch retention in the sheet and can lessen or even eliminate the foam.

Advancements in economical late addition technology have changed the way chemicals are added late in the process. Nanoparticles have historically been added late in the process. Starch and polymers are now being added later as well for improved economics. When adding products late, especially after the headbox, quick and complete additive mixing becomes key to chemical efficiency as well as to machine CD profiles and therefore runnability. Feed systems such as the new Eka Netics from AkzoNobel are designed for extremely fast mixing with minimal amounts of fresh water or even no fresh water usage.

Almost all papermaking wet end additives are cationic. This includes retention aids, starch, wet strength, dry strength, sizing agents, PAC and alum. Silica nanoparticles are anionic. Therefore the additives are attracted to each other and help to improve their retention in the fiber web which in turn keeps them from circulating around in the white water and potentially causing foam and/or deposits.

In packaging machines it is very common to have a charge imbalance due to all the cationic additives. This is especially true in 100% recycle machines where the anionic trash loading can be low (compared to kraft) and there is not a lot of cationic demand. The addition of the highly anionic nanoparticle helps to restore the charge balance. It is important for machine runnability to maintain the charge in a range and to keep it stable.

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Conductivity umhos/cm 1148
Sulfate mg/L 274
Bromide mg/L <1
Chloride mg/L 22

Figure 4 is an example of a mill white water elemental analysis.

Figure 3 is an actual charge profile from an unbleached liner machine.
Historically, a lot of liner machines which used a lot of cationic additives used APAM (anionic polyacrylamide) for retention. APAM’s however are very high molecular weight and often do not contribute to drainage as anionic nanoparticles do. Machines that still run APAM today are excellent candidates for the conversion to the more effective and modern silica programs. For example several acid and neutral liner machines in North America have converted to AkzoNobel’s surface modified Eka NP 2180 in the last 2-3 years.

**BENEFITS**

Typical benefits from a silica nanoparticle retention and drainage system include:

- Improved colloidal retention
- Improved dewatering
- Improved formation
- Improved charge balance

1. **Improved colloidal retention** primarily manifests itself in the improved retention of wet strength, size and starch leading to a significant foam reduction, less defoamer usage and cleaner wet end. The improved starch retention allows for a later (thinstock) addition of starch which in turn lowers retention costs at the same strength levels. There are more chemical savings to be realized by adding long chain, floc forming starch and polymer late in the process after shear points such as a primary pressure screen. Mills spend good money to create a fiber floc which helps with retention and drainage. It doesn’t make sense to subject that floc to shear and break it down unless the machine is extremely formation sensitive like earlier generation fine paper or solid bleached board machines.

2. **Improved dewatering** means better drainage in the forming section and easier mechanical release of water in the press section. This in turn leads to increased speed, production and runnability or can be used to save on dryer steam consumption. Board machines that are not targeting higher dryness out of the press section can use the increased forming section drainage to lower their headbox consistency, therefore improving formation and quite often strength. Many packaging strength tests are improved with better formation and therefore more fiber to fiber contact.

3. **Improved formation** can be realized by using lower molecular weight drainage and retention chemistries such as silica. High molecular weight polymers have a detrimental effect on formation.

4. **Balancing your wet end colloidal charge** is important. The key is to have a stable headbox cationic demand and not cross over the isoelectric point. Unstable charge leads to foam and poor runnability. Cationic additives create a charge level nearer the isoelectric point.

**CONCLUSION**

Today, with the reduced personnel mills are running with, Wet End Managers come in many forms. The Wet End Manager could be a Process Engineer, Mill Superintendent or even the Mill Manager. The following straight-forward questions will help the Wet End Manager determine if the mill needs to move to a modern silica based retention and drainage program.

- What would better forming section drainage do for me? Increase speed, reduce steam costs?
- Do I spend significant dollars on starch? Am I retaining it? Do I get foam? Does my wet end run dirty as a result (HB or wire guide roll deposits)?
- Do I still add starch to the thick-stock?
- If I run no starch and just polymer does my polymer give me drainage or only retention?
- Would opening the slice and lowering HB consistency help my formation? Would it help my strength test?
- Do I use a lot of cationic additives?
- Does my cationic demand (Mutek) vary?

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A wave of recent breakthrough developments in automation is revolutionizing the quality and runnability management of tissue lines. These include the development of a non-nuclear basis weight sensor that also measures the moisture content of the web, the first tissue color measurement and automatic control, a steam profiler with significantly higher heat absorption coefficient (twice of the traditional concept) and exceptionally narrow cross directional response for excellent profiling capability, a new integrated process and quality vision system with high-definition cameras, and most recently a furnish analyzer that helps to predict how fiber properties will affect final sheet strength properties. The new analyzer also enables precise furnish preparation and refining management resulting in better sheet runnability, higher machine efficiency and lower furnish costs.

There is now significant application experience obtained from the deployment of these solutions in the automation concept of tissue lines. For example, more than 60 tissue lines are using the quality control systems equipped with the single-sensor solution for non-nuclear weight and moisture measurements with almost 40 more to be installed soon. Also, the steam profiler solution has been very popular with tissue makers resulting in significantly higher energy savings, dryness increase, and excellent cross directional uniformity.

This article focuses on the application results and benefits of the innovative breakthrough solutions now available for tissue makers. There is also increased interest in the application of charge analyzers. The benefits and results of on-line charge measurements are also discussed.

**TISSUE AUTOMATION CONCEPT**

Metso’s comprehensive tissue automation concept is designed along with the process and machinery developments of its Tissue Business Line. As such, it addresses many challenges that tissue makers have to face, such as dealing with the complex chemistry in tissue making, achieving better runnability and higher energy efficiency. First, we cover some of the newly updated solutions that enhance our ability to deal with some of these challenges.

**Breakthrough Automation Concept Delivers Stable, Productive Tissue Machine Operation**

Comprehensive but scalable automation solution is geared towards optimum productivity, energy efficiency and product quality.

By Seyhan Nuyan
Pulp Analyzer and Fiber Image Analyzer. Metso MAP has recently been upgraded to include a new online microscopic scale fiber fibrillation measurement. With the additional online measurement of freeness and other fiber properties, the analyzer is invaluable for achieving optimum drainage and sheet quality properties. More precise furnish preparation and low consistency refining management provides better sheet runnability and higher machine efficiency. Both Metso MAP and brand new off-line Metso Fiber Image Analyzer (Metso FS5) use the same HD technology for imaging analysis, thus these two products fulfill nicely Metso portfolio for fiber furnish measurement solutions.

It has been well known for some decades now that if the proper amount of refining energy is put into pulp fibers they will develop more surface area. This increase in surface area of the fiber is referred to as its “degree of fibrillation.” Fibrillation is promoted by mechanical treatments in refiner stages and has positive impact on sheet strength. It also affects the sheet structure and optical properties. So, it is an important fiber property that was possible to measure in the laboratory until now. Metso MAP is the first device that brings this capability to online. This measurement is also important for optimum blending for final tissue properties as the effect of different furnish components can be contradictory for certain sheet properties. For example, while chemical softwood usage increases the strength properties of the sheet, it is not effective in achieving better surface softness. The latter can be effectively managed by using more or less hardwood in the mixture. They both increase brightness however.

DNA Machine Monitoring. Metso DNA Machine Monitoring, embedded within the Metso DNA control system platform, continuously measures and analyzes the mechanical condition of tissue making machinery and processes. Mechanical vibrations, process pulsations and creping blade chatter are detected promptly so corrective action can be taken to ensure stable sheet quality and runnability. In addition, maintenance actions can be made proactively and cost-effectively. Additionally, oil and lubrication functions are available with this solution to reduce unplanned shut-downs. The system also improves the security of the operation.

Process and Quality Vision. Metso Process and Quality Vision (Metso PQV), with its new high speed and high resolution cameras, can isolate and define the causes of sheet flaws and breaks, thereby allowing machine operators to avoid their re-occurrence. With the system’s high resolution capability, very small flaws and sheet instabilities can be resolved at a web speeds over 2000 m/min. The system uses combined camera and LED lights for easy installation and compact operation. The super bright flashing LED lights operate at less energy level providing further savings. The unified Web Break Monitoring System (WMS) and Web Inspection System (WIS) can be utilized on the machine, winders, and/or converting operations of the production chain.

UNIQUE DNA AUTOMATION PLATFORM

These newly developed solutions as well as the entire tissue automation concept highlighted briefly in the remainder of this article are implemented on Metso’s unique automation platform — Metso DNA. Whether the mill’s automation need is in a DCS or QCS functionality or simply in a Machine Control System (MCS) or Drive Control System, they are all implemented on a uniform architecture using the same hardware and software environment.
Metso DNA is modular and scalable that is used for a small or big system, for all tissue machine concepts, and utilizes the same infrastructure in all cases. These features make Metso DNA architecture a very cost-effective automation environment. Scalability and modularity provided in a uniform environment are huge cost and operational benefits to users.

**IQ SYSTEMS**

These new analytical products complement responsive online sheet quality measurements and controls by the Metso IQ quality control system. MD and CD controls of fiber weight and moisture are based on IQ Fiber Weight Measurement — a single infrared sensor which replaces traditional nuclear sensors. Metso was the first automation supplier to introduce this single sensor to the tissue market. This simplified nuclear-free, single sensor solution has other advantages such as speed of measurement and its dust tolerance. To match the reduced space requirements on the scanning platform, Metso has also introduced a smaller platform reducing the space requirements in the machine direction.

As discussed in the previous section, Metso’s QCS solution is native to the Metso DNA automation platform utilizing the same processors, software environment, operator and control functions, engineering system, and remote accessibility. As such, it is also scalable within itself whether the need is a simple scanner with weight and moisture measurements, MD controls and reporting functions (all provided with a small ACN processor inside the frame) or a larger scale QCS with perhaps multiple scanners and/or sensors, control room functions and/or one or multiple CD controls.

The system’s measurement and control capabilities include online tissue shade using IQ Web Color Measurement, specially developed for tissue applications. This is the first of its kind capable of measuring color or brightness of finished tissue or towel product.

Dilution Profiler and Steam Profiler. Metso IQ Dilution Profiler and Metso IQ Steam Profiler provide uniform CD sheet quality. In addition to reducing Yankee air cap drying energy requirements the high heat steam profiler allows significant production increases.

Also, as part of a comprehensive automation solution Metso’s consistency, retention and furnish charge analyzers and controls stabilize the wet end operation. The charge analyzer, Metso Wet End Analyzer, is particularly valuable for precisely controlling wet end functional additives and ensuring retention and white water fines levels are in balance.

Some of the DCS function such as Process Replay, Machine Help and Energy and Cost Monitoring functions are almost certainly unique to Metso’s Tissue Concept and provide significant benefits to the user.

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**IQ Dilution Profiler**

Modular construction minimizes the need for service and spare parts.

- ±0.05% positioning resolution, minimum
- Actuator automatic calibration
- ±43 degree movement range standard
- 20 Nm nominal torque
- Valve difference limitation
- Absolute position feedback sensor, 0.01% resolution

- Purge air, waterproof housing
- Virtually parallel positioning in a few seconds
- Minimum spacing 60 mm in one row

**IQ Web Color** is an online, scanning spectrophotometer that measures sheet color, brightness, whiteness, and opacity.
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Global Opportunities in the Folding Carton Market

Retail-ready packs, anti-counterfeit systems and barrier coating technologies will drive the global market for folding cartons.

The global market for folding cartons is growing by 5.1% annually, and will reach $184 billion by 2018, according to a recent study by Smithers Pira. Market growth will be led by increased demand for health care products, cigarettes, dry foods and frozen/chilled foods, especially in the emerging economies.

*The Future of Folding Cartons to 2018* identifies three key technologies that will result in added value in the folding carton market between 2013 and 2018 are: retail-ready packs (mainly in microflute), anti-counterfeit systems and barrier coating technologies. Retail-ready packaging is a growing trend amongst retailers striving to reduce their costs and comes in the form of corrugated/microflute systems, rigid plastic and some rigid board products. Anti-counterfeit technology used in folding carton applications is expected to almost double with high growth expected, especially in the health care sector. Developments in water-based coatings, nano-materials, bio-polymers and antimicrobial compounds are leading the growth for barrier coatings.

**Global Trends**

According to Smithers Pira, a global trend towards smaller packs will be offset by an increase in demand for single serve portion packs. Smaller packs tend to use more total packaging material than the larger packs they replace, for the same volume of packed product.

Consumer electronics continue to offer great opportunities for folding cartons and microflute packs with the continued global growth in demand for mobile phones, tablets, and other personal devices.

The health care sector, accounting for nearly 10% of the folding cartons demand, will see a call for the development of smart packs able to provide a system for monitoring patient medication. The level of counterfeit goods, and the health threats these products pose, is stimulating demand for sophisticated track-and-trace systems in the form of either 1D barcodes, 2D barcodes or RFID systems.

Global demand for convenience foods and the development of niche markets such as low calorie products are growth opportunities for both the dry and frozen foods sectors. In the confectionery market, perceived over-packaging has been a focus of consumer discontent, leading to considerable innovation in the packaging of seasonal products such as Easter eggs and Christmas gift packs.

According to the report, personal care market has shown a rapid recovery from the global recession and growth is being stimulated by the use of technology in the form of social media, mobile commerce and in-store digital technologies, targeting the tech-savvy young consumer. Eco-friendly brands are gaining prominence and demand for innovating printing techniques such as Fresnel lenses is growing.

**Volume Growth**

Globally, cartonboard production grew by 1.3% in 2012 to reach a total of 42.5 million tonnes, valued at $37.3 billion, with more than half of this volume located in the Asia-Pacific sector. The top five producers of cartonboard constituted almost 16% of the total volume in 2012, with the top ten making up over a quarter. The 20 largest producers accounted for 40% of the market.

Total volume of converted folding carton grew by over 1% to reach 47.4 million tonnes in 2012, with 55% of this emanating in the Asia-Pacific sector. The five largest cartonboard converters make up almost 7% of this somewhat fragmented market, while the ten largest converters accounted for more than 9% of the volume in 2012.

*The Future of Folding Cartons to 2018* is available from Smithers Pira at: www.smitherspira.com.
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