CONTAINERBOARD
Capacity bulge, sluggish demand remain challenges for containerboard market

DRYER SECTION PERFORMANCE
Five easily applied dryer performance indicators make way for optimal energy efficiency
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FEATURES

18 Easy-to-Apply Dryer Performance Indicators
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If at first you don’t succeed...

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

...try, try again. With that in mind, Verso Paper on January 6 announced that it would acquire NewPage in a deal valued at $1.4 billion. This will be a very big deal if the two companies can actually get past the initial proposal stage. They’ve been down this road before and it has been a very, very bumpy ride to say the least.

As some may recall, the on-again, off-again romance between Verso and NewPage dates back to 2010 and early-2011. At that time, private equity owners, Apollo Management (Verso) and Cerberus (NewPage), were reportedly in talks that most industry observers presumed were about the combination of North America’s two largest coated paper producers. However, many analysts pointed out that the two papermakers carried much too much debt for the deal to make financial sense, especially to certain groups of lienholders.

Nothing, it appeared, but speculation resulted from those talks, and on September 7, 2011, NewPage filed for creditor protection under Chapter 11.

As NewPage moved into its tenth month of reorganization, Verso on July 2, 2012 announced that it had “held discussions with certain holders of the 11.375% first-lien senior secured notes of NewPage Corporation in an effort to achieve a potential business combination involving Verso and NewPage as part of a consensual plan of reorganization in NewPage’s Chapter 11 bankruptcy proceedings.”

How did that proposal go over? Not very well; not very well at all. Just ten days after the proposal, an attorney representing holders of first-lien debt strongly rebuffed the deal in a letter to Judge Kevin Gross, U.S. Bankruptcy Court in Delaware. The letter concluded that (1) Verso’s market position would be greatly improved if Verso was able to acquire NewPage’s assets at fire sale prices or if debtors fail to reorganize; (2) Verso is significantly threatened by the possibility that NewPage will successfully reorganize under a stand-alone plan and emerge from bankruptcy a stronger, healthier company with a deleveraged balance sheet; and (3) Verso stands to benefit from any delays in the debtors emergence from bankruptcy and can be expected to oppose all stand-alone plan proposals and any near-term restructuring.

Over the summer of 2012, the two companies sparred until Verso on Sept. 4 finally called a halt to its pursuit of NewPage, stating that “it has decided to cease further discussions with NewPage Corporation or its creditors regarding a potential business combination.”

Or maybe not. After a 16-month regrouping period, both parties, it seems, have had a change of heart and are in agreement to the structure of a new deal (see page 6) — a very complicated deal. In a recent presentation by Verso, “NewPage Operating Company would be a non-guarantor restricted subsidiary for Verso’s notes with a standalone capital structure.”

Moody’s Investor Services explains it like this, “It is anticipated that following the acquisition, Verso and NewPage will be run as separate legal entities with a shared services agreement.”

Regardless of the complexities, Verso has hung in there, I’ll grant it that. And although there remains a lot of people to satisfy, including possibly antitrust regulators (Verso and NewPage would have at least 50% of the coated freesheet market), perseverance may be the lynchpin that sees the deal through this time around.
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**NORTH AMERICA**

**Verso Paper to Acquire NewPage in $1.4 Billion Deal**

Verso Paper and NewPage on Jan. 6 announced a definitive agreement under which Verso will acquire NewPage in a transaction valued at $1.4 billion.

Upon closing of the deal, the combined company will have sales of approximately $4.5 billion and 11 manufacturing facilities located in six states.

The transaction, which has been unanimously approved by the boards of directors of both companies, is expected to close in the second half of 2014, subject to regulatory approvals.

“The combination of Verso and NewPage will create a stronger business that is better positioned to serve our customers and compete in a competitive global marketplace,” said David J. Paterson, Verso’s President and CEO.

“We continue to face increased competition from electronic substitution for print and international producers, but as a larger, more efficient organization with a sustainable capital structure, we will be better positioned to compete effectively and deliver solid results despite the industry’s continuing challenges. Furthermore, we believe the transaction provides stakeholders in both companies with meaningful, compelling value,” Paterson said.

The combination of the two companies is expected to result in at least $175 million of pre-tax total cost synergies, which are expected to be achieved during the first 18 months after completion of the transaction.

Dave Paterson will lead the combined organization.

Under the terms of the deal, NewPage’s equity holders will receive total cash and debt consideration of $900 million, consisting of $250 million in cash, most of which will be paid to the stockholders as a special dividend prior to closing and the remainder of which will be paid at closing, and $650 million of new Verso first lien notes to be issued at closing.

NewPage’s equity holders also will receive shares of Verso common stock representing 20% (subject to potential adjustment up to 25% under certain circumstances) of the outstanding shares as of immediately prior to closing. Certain of NewPage’s stockholders owning a majority of the outstanding shares of NewPage common stock have agreed to vote their shares in favor of the approval of the transaction.

Verso will finance the acquisition through $750 million in committed financing, which will be used to pay the cash portion of the merger consideration and to refinance NewPage’s existing $500 million term loan prior to closing.

The value of the transaction is $1.4 billion, composed of the cash consideration, the $650 million of new Verso first lien notes, the Verso common stock and the refinancing of NewPage’s $500 million term loan.

**Fox River Fiber Begins Use of Wastewater Pre-treatment Facility**

Fox River Fiber announced that it has begun utilizing a $7 million wastewater pre-treatment facility designed to reduce the company’s environmental impact from its pulp manufacturing operations.

The De Pere, Wisconsin-based pulp manufacturer utilizes post-consumer fiber as its primary raw material for making high-quality pulp.

According to the company, the on-site anaerobic digesting system creates cleaner industrial wastewater prior to releasing it to the Green Bay Metropolitan Sewerage District.

Fox River Fiber said that it plans to sell the recovered biological solids to other anaerobic treatment facilities for use as seed in treatment towers.
NORTH AMERICA

Resolute to Indefinitely Shutdown the Last Paper Machine at Fort Frances Mill

Resolute Forest Products has announced the indefinite shutdown of the last operating paper machine at its mill in Fort Frances, Ontario by the end of January.

The measure will, in effect, shut down the entire mill.

Some 150 workers will be impacted by the decision.

Late in November of 2012, Resolute shutdown the kraft mill at Fort Frances, which has an annual production capacity of approximately 200,000 metric tons of market pulp, and PM5, which has an annual capacity of 105,000 metric tons of groundwood specialty printing papers.

According to a CBC news report, Resolute attributed this latest shutdown as the result of poor market conditions, although company president Richard Garneau said the paper machine will be kept ready for future operation.

In the meantime the company said it is looking for alternative products for its Fort Frances operation, especially related to the pulp mill.

RockTenn Acquires NPG to Expand Retail Innovation and Solutions

RockTenn in early-January acquired NPG, Inc., a leading independent merchandising displays company.

Headquartered in Chattanooga, Tennessee, NPG provides a broad range of display products and services to many of the world’s most recognized retailers. NPG employs approximately 400 co-workers and operates two manufacturing facilities in Chattanooga and one in Las Vegas, Nevada.

“NPG’s focus on retailers, their innovative retail solutions and large-format printing capability expands our customer base and significantly improves RockTenn’s ability to provide retail insights, innovation and connectivity to all of our customers,” said Craig Gunckel, executive vice president, RockTenn, and general manager, RockTenn Merchandising Displays.

NPG will operate as RockTenn Retail Solutions.

Phil Harris, formerly chief executive officer of NPG, has been named vice president and general manager, RockTenn Retail Solutions. Harris will continue to manage the operations along with his current leadership team.

“NPG is a strong strategic fit for us that will strengthen our display business,” said Steve Voorhees, RockTenn’s chief executive officer. “I am excited to have the NPG team join RockTenn and look forward to supporting their continued success.”

NPTA Presents 2014 Stanley O. Styles Industry Excellence Award to Don and Max Clampitt of Clampitt Paper

The National Paper Trade Association (NPTA) announced the recipients of its 2014 Stanley O. Styles Industry Excellence Award — NPTA’s highest honor. For the first time in the award’s 30-year history, it will be presented to two industry leaders, Don and Max Clampitt of Clampitt Paper.

“Over the years, there are only a very few whose names are synonymous with the merchant and paper business. Clampitt is one of those rare names,” said Tom Gallager, President of West Linn Paper Company. “Max Clampitt was a leader in every regard.”

Max Clampitt was born in 1912 in Ruston, Louisiana and founded Clampitt Paper with his wife, Mary-Nell, in 1941.

“Max Clampitt was a force in the merchant community,” said James C. Tyrene, EVP of Commercial Operations and Business Development, NewPage Corporation. “He built a highly reputable and successful merchant business from the ground up. Don continued with the same focus on customers that Max did.”

Don Clampitt began his 34-year career in the paper industry working in the warehouse of Clampitt Paper during high school. He returned to the firm after graduating from the University of New Mexico and since that time has worked in almost every position in the company. When Max passed away in 2001, Don stepped into the President and CEO role.

“In a time when paper is too often reduced to a commodity, Don still loves to talk about what makes paper, particularly premium paper, unique,” said Tom O’Connor, Chairman and Chief Executive Officer of Mohawk. “He pioneered the establishment of a Creative Center where designers and printers can come look at samples and talk about their work. Don is the only CEO of a major paper distributor I know of who still loves to go out and teach paper classes for customers and design students.”

In addition to launching the Clampitt Creative Center in 2004, Don has grown the Clampitt brand to include 15 retail stores and six warehouse locations and expanded to Tulsa, Albuquerque and Kansas City.

Don Clampitt noted, “My father was the true visionary behind Clampitt Paper, and I am honored to be considered with him as a recipient of this award.”

Don Clampitt will accept the Stanley O. Styles Industry Excellence Award on behalf of himself and Max at the Paper2014 convention, March 23-25 in New York City.
The Association of Suppliers to the Paper Industry (ASPI) has named Paul Duncan as the recipient of its 2014 Excellence in Leadership Award. Duncan serves as mill manager at KapStone Paper and Packaging’s Longview Mill in Longview, Washington, where he is responsible for managing all of the manufacturing, maintenance and support operations of the mill.

“The Longview mill’s turnaround has been an incredible achievement for everyone involved, and Paul Duncan has been a big part of that change,” said ASPI President Carl Howe, vice president sales for Kadant Paperline. “His professionalism, his technical knowledge, and the example he sets for his employees all deserve to be recognized and applauded.”

As mill manager, Duncan played a critical role in the recent transformation of the Longview mill, which resulted in a production increase of 39% between 2007 and 2012. He also played a key role in improving the mill’s safety culture, and was named “Safety Manager of the Year” at the Western Pulp and Paper Workers Conference in 2012.

ASPI’s Excellence in Leadership Award honors unique and creative leadership of employees, company and key suppliers through major projects or ongoing relationships. ASPI accepts nominations from its members, and the Board of Directors votes to determine the recipient.

Duncan is scheduled to accept the award at the ASPI 2014 Spring Meeting, which will be held February 26-28, 2014 in Sarasota, Florida.

Ahlstrom has sold the converting operations of its West Carrollton plant in Ohio to West Carrollton Parchment and Converting Inc., an Ohio-based family-owned company.

The parties have agreed not to disclose the value of the deal.

Under the terms of the deal, Ahlstrom sold its vegetable parchment converting assets and related order book to West Carrollton Parchment and Converting. The approximately 70 employees at the plant will transfer to West Carrollton Parchment and Converting.

As part of the sale, Ahlstrom and West Carrollton Parchment and Converting will establish a long-term supply agreement for vegetable parchment paper, which is primarily used in food packaging.

International Paper announced that the name of its group company, The Andhra Pradesh Paper Mills Limited (APPM), has been changed to International Paper APPM Limited, effective Dec. 16, 2013.

The company currently operates through two paper mills at Rajahmundry and Kadiam in Andhra Pradesh under APPM’s name.

“The new name recognizes the parentage of International Paper while maintaining the link to the history of the APPM brand,” explained Michael Amick Jr, President, IP India and Executive Chairman, International Paper APPM Limited.
EUROPE

CEPI Director General Teresa Presas to Step Down, Marco Mensink Named Successor

After 10 years at the helm of CEPI, the Brussels-based Confederation of European Paper Industries, Teresa Presas has decided to leave the organization at the end of May this year. In the coming months she will ensure a smooth transition of the leadership of CEPI to her designated successor Marco Mensink, who has already worked with Presas as CEPI’s Deputy Director General for the last two years.

Presas commented, “It has been ten years of an enriching experience and of relentless work. In the last years, we have consolidated our organization, successfully defended its interests and laid out our long-term vision for the sector in the CEPI 2050 Roadmap.

“The coming years will be about implementation at the different levels, including the progression of the breakthrough concepts that came out of the Two Team project. Therefore, it is a good moment for me to leave the organization and move on to another life. I wish my colleague and successor Marco Mensink every success in the future,” Presas concluded.

Domtar Completes Acquisition of Spain’s Indas

Domtar on Jan. 2 closed the acquisition of privately-held Laboratorios Indas, SAU (“Indas”), pursuant to a definitive agreement announced on November 19, 2013.

Indas is Spain’s largest manufacturer and marketer of branded adult incontinence products, with its IncoPack and Indasec line of products.

Domtar acquired all the outstanding capital stock for EUR285 million and the business was expected to have about EUR140 million of debt, net of cash, at closing. Prior to the closing, Domtar explained, “the net debt is expected to be reduced by the collection of approximately EUR25 million of past due accounts receivable before year-end or early 2014, resulting in an enterprise value of EUR400 million. The majority of the debt will be repaid by Domtar in connection with the closing of the transaction.”

John D. Williams, President and CEO of Domtar, commented, “The acquisition of Indas advances our transformation into a leader in Personal Care, an attractive market segment that is an important growth engine for Domtar. With the addition of the new business, Domtar will become one of the leading adult incontinence products manufacturers in Europe.”

Double A Agrees to Buy Pulp Mill in Alizay

Thailand-based pulp and paper producer Double A said that on December 17 it agreed to acquire the pulp mill and bio-mass power plant that is situated next to the site of its Alizay paper mill in France.

Terms of the deal were not disclosed.

Double A is buying the pulp mill from the Department of Eure in Northern France.

Jean Louis Destans, Chairman of the General Council of the region of Eure, said, “We have agreed on the selling price of the land, the buildings and the assets necessary to revive the production site. All that remains is for us to prepare and sign the deeds as soon as possible. This is in both parties interest as it will initiate the revival of paper pulp production on the site.”

On January 23, 2013, the Department of Eure bought the property and production assets of the Alizay pulp and paper mill site from Metsa Board for EUR 22 million. On the same day, the Department sold the paper mill to Double A for EUR 18 million.

Double A said the investment in the pulp mill will also include investment in the site’s bio-mass power plant.

Thirawit Leetavorn, Senior Executive Vice President of Double A, noted, “2013 marked a successful return of the Alizay Paper Mill, which returned to full production in June and was producing premium quality Double A paper by August. The mill began exporting paper in September to the UAE and Eastern Europe.”

Double expects to restart the pulp mill in the first quarter of 2015.

SOUTH AMERICA

Suzano Starts Up New 1.5 Million TPY Pulp Mill in Maranhao

Suzano Papel E Celulose S.A. recently started up operations at its new pulp production unit located in Imperatriz, Maranhao, Brazil.

The first bale of pulp was produced on December 30 with FSC certification, Suzano said.

The new pulp mill will have eucalyptus market pulp production capacity of 1.5 million tons per year and surplus power generation of 100 MW.

Suzano said mill personnel are now focused on effectively executing the ramp-up period to ensure an adequate learning curve.

Suzano expects the pulp mill to produce about 1.1 million tons in 2014.
**SOUTH AMERICA**

**Fibria Continues Feasibility Studies on Expansion of Tres Lagoas Pulp Mill**

Fibria announced that it is continuing with the feasibility studies for the expansion of its pulp mill in Tres Lagoas (Mato Grosso do Sul State), Brazil. The company met with approximately 150 representatives of the main 36 equipment supplier companies of the pulp industry in the interior of São Paulo state.

“The idea behind the meeting was to invite [the representatives] to participate in the detailing stage of the project, which should be submitted to the approval of the Board of Directors by the end of the first half of this year,” Fibria explained.

Fibria’s new pulp line in Tres Lagoas, which already has environmental licensing, and, if installed, will have a capacity 1.75 million tons per year, would increase the mill’s total pulp production capacity to 3.05 million tons per year, making it the largest pulp industrial unit in the world.

Fibria said that it is making every effort to take advantage of a window of opportunity for the start-up of its new pulp capacity, and that it already has a major portion of the wood supply needed for the new plant’s operations.

Fibria expects the new line to begin operations at the end of the fourth quarter of 2016.

The Tres Lagoas mill opened on March 30, 2009 and has a bleached eucalyptus kraft (BEK) pulp production capacity of 1.3 million tons per year. The mill is self-sufficient in energy, using biomass from eucalyptus and black liquor used in the industrial process.

**Norske Skog and CellMark Agree to Paper Distribution Deal in Asia**

Norske Skog and CellMark AB have entered a long term marketing agreement for sales of publication paper in the Asian markets and established a new distributor in Singapore, NorCell Asia, which holds exclusive marketing rights for all Norske Skog products to be sold in the Asian markets.

Norske Skog is transferring its current sales operations and sales staff in Singapore from PanAsia Paper Trading to NorCell Asia.

Norske Skog plans to release about USD 15-20 million in working capital by the cooperation with CellMark in the Asian markets.

**INDUSTRY SUPPLIERS**

**Minerals Technologies to Build Satellite PCC Plant for UPM in China**

Minerals Technologies has signed an agreement with UPM to build a satellite precipitated calcium carbonate (PCC) plant on-site at UPM’s paper mill in Changshu, China, located in Jiangsu province. The satellite plant will provide PCC — a specialty pigment for filling and coating high-quality paper — to the mill and have an initial capacity of 100,000 short tons.

“We are extremely pleased that UPM, a premier global papermaker, has chosen Minerals Technologies’ PCC for their paper-filling needs at their mill in Changshu,” said Robert S. Wetherbee, CEO of Minerals Technology. “This is our fourth satellite agreement in China within approximately one year, bringing our total to seven in that country.”

The plant is scheduled to begin operation early in 2015.

**Wuhan Chenming Starts Up Valmet-supplied Tissue Line in China**

A new tissue line delivered by Valmet (formerly Metso Pulp, Paper and Power) successfully came on stream at Wuhan Chenming Hanyang Paper Co. Ltd’s mill in Wuhan, China, in November 2013. This is the customer’s first tissue line, Valmet said.

According to Valmet, the new Advantage DCT 200HS tissue line started up ten days before the estimated time and is now producing high quality tissue at high speed. With a width of 5.6 meters and an operating speed of 1,900 m/min, the new production line will produce 60,000 tons a year of high-quality facial, toilet and towel grades.

The raw material for the new line is virgin pulp, Valmet said.

The delivery comprised a complete production line with stock preparation equipment and an Advantage DCT 200HS tissue machine including an OptiFlo II TIS multi-layer headbox, a cast alloy Yankee cylinder, an Advantage AirCap hood, an Advantage WetDust dust management system and an Advantage SoftReel reel.

The delivery also featured Valmet’s patented Advantage ViscoNip pressing technology.
India’s Printers at Odds with Paper Producers’ Price Hikes

India’s paper and board manufacturers in 2013 pushed through substantial price hikes that they say were necessary to offset rising input costs, while the region’s printers have watched their profit margins shrink to unacceptable levels.

According to a report in PrintWeek (India), paper and board producers in fiscal 2013 increased prices by 10 – 15%, and some cases as much as 20 – 30%. The papermakers attribute the price hikes to the increasing cost of domestic wood as well as imported materials such as pulp and coal, due to Rupee’s depreciation.

“Paper mills are importing pulp wood, even if it is costlier by 30 - 40%, as domestic stocks are scanty. JK Papers cites the reason for this to be a disease outbreak that hit tree plantations in Andhra Pradesh three years ago; and because of this, the gross tonnage of wood availability has taken a nosedive. Though companies have stepped up farm forestry, it will take another couple of years before normalcy can be restored,” explains Anand Srinivasan, author of the PrintWeek report.

In addition, India’s papermakers will have to deal with a reduction on import duties in 2014. “The domestic paper industry, which is struggling to cope with high input costs and chronic shortage of wood pulp, will face a new challenge in 2014 – duty-free import of paper from Southeast Asian countries,” said Anand Srinivasan, author of the PrintWeek report.

However, India’s printers are unsympathetic and say the frequent price increases come without warning. In an open letter to the chairman of the Competition Commission of India (CCI) in New Delhi, the Sivakasi Master Printers’ Association (SMPA) called on CCI to take action against the paper mills that would stop what has been termed “unfair trade practice” and substantially reduce the arbitrarily increased prices, as well as to direct the mills to maintain prices at least for a period of four months.

“The print industry needs to be protected from the clutches of paper mills which are into the process of making print industry a scapegoat at the altar of price increase, leading to the question of survival in the future,” SMPA wrote.

Domestic printers point out that many have annual contracts with their customers and are unable to pass along the increases. “The price has increased twice or thrice in the last two quarters of 2013, taking the landed prices up by 20–30%. It has hit the bottom line, as the cost cannot be passed on to the customers in near terms,” said Vasant Goel, Director, Gopsons Papers, one of India’s largest integrated print houses.

For now, Srinivasan says, many printers are resorting to buying from cheaper mills or considering importing paper stocks despite the Rupee’s depreciation.

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
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Paper2014 is hosted by the American Forest & Paper Association and NPTA.
Ahlstrom announced that Sakari Ahdekivi has been appointed Chief Financial Officer and member of the company’s Executive Management Team. He will join Ahlstrom on February 1. Prior to Ahlstrom, Ahdekivi was Managing Director at Tamro Finland and Baltics.

Appvion announced that Matt Denton has been appointed Senior Vice President and General Manager of the company’s carbonless and security papers business; and Jason Schulist has joined Appvion as Vice President of Continuous Improvement.

Atlas Paper Mills has named Jim Brown as Chief Executive Officer. Brown succeeds Joe Tadeo, who left the company to pursue outside interests. Brown most recently served as an Executive Vice President at Duro Bag Manufacturing Company.

Greif has appointed Peter Watson as Chief Operating Officer of the company. Watson was group president responsible for Greif’s Paper Packaging and Land Management business segments as well as Global Sourcing & Supply Chain and the company’s Greif Business System capabilities.

Mac Papers has named Craig Boortz as the new Vice President and Regional Manager. He succeeds Steve Bethea, who is retiring after more than 42 years with the company. In a related move, David McGehee, Jr., succeeds Boortz’s as General Manager in Greenville, SC.

PaperWorks Industries has named William McSwain as interim President and CEO, replacing Mark Staton, who departed in January. McSwain is a seasoned business executive with leadership experience in many industries.

Rayonier has elected Lynn Wilson to the position of Executive Vice President, Forest Resources. Wilson is a member of Rayonier’s senior management team and is responsible for 2.6 million acres of timberland in nine states and New Zealand.

Twin Rivers Paper Company announced that Tony Rigelman has joined the company as Vice President, Sales. Rigelman has over 19 years of industry experience in a variety of leadership roles, serving most recently as Director of Sales for Technical and Specialty Papers at Domtar.

INDUSTRY SUPPLIERS

Ashland Water Technologies has hired Jeff Fulgham as vice president, marketing. He most recently served as chief sales and strategy officer for Banyan Water, based in San Francisco.

OASIS Alignment Services has named Brian J. Hiltunen as President. He succeeds Ray Masse, who will continue as Chairman of the Board. Previously, Hiltunen served as Vice President and General Manager for OASIS.

Thiele Kaolin Company recently announced the following changes within its sales leadership: Eric Tillirson has been promoted to Senior Vice President and Director of Sales Development; Mike Markillie has been promoted to Director of World Wide Sales and Technical Service; Scott Ahrens has been promoted to North American Sales Manager; and Tom Bennett has been promoted to Sales and Marketing Manager.

INDUSTRY-RELATED

The Confederation of European Paper Industries (CEPI) has appointed Gary McGann as its new Chairman. McGann is Group CEO of Smurfit Kappa. He succeeds outgoing chairman, Jussi Pesonen, the President and CEO of UPM.

University of Maine alumna Carrie Enos has been named president of the University of Maine Pulp & Paper Foundation. She replaces Jack Healy ’74, who has held the position since 2007 and is retiring this spring. Enos has worked in the paper industry since 1997, most recently in the position of finished products business unit manager at the Verso Paper Mill in Bucksport.
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Grand Hyatt New York
New York, New York, USA
www.risinfo.com/events

FEBRUARY 26-28, 2014
ASPI Spring Meeting
Association of Suppliers to the Paper Industry
Ritz-Carlton
Sarasota, Florida, USA
www.aspinet.org

MARCH 18-21, 2014
Tissue World Americas
UBM Asia Trade Fairs
Miami Beach Convention Center
Miami, Florida, USA
www.tissueworld.com

MARCH 23-25, 2014
Paper2014
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New York Palace Hotel
New York City, New York, USA
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APRIL 2-4, 2014
Spring Outlook and Strategies Conference
Paperboard Packaging Council
Royal Sonesta Hotel
New Orleans, Louisiana, USA
www.ppcnet.org

APRIL 27-30, 2014
PaperCon
TAPPI
Nashville Convention Center
Nashville, Tennessee, USA
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MAY 4-7, 2014
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Capacity Bulge, Sluggish Demand Remain Challenges for Containerboard Market

2013 wasn’t a bad year for containerboard mills but results were decidedly mixed. Price increases were enacted on board and corrugated boxes in early 2013 that boosted margins, but underlying box demand was stagnant. 2014 offers hope that improved economic growth can propel box demand to stronger gains, but the impact of new containerboard capacity remains a nagging concern.

By Harold M. Cody

Over the course of the last 12 months the containerboard industry was characterized by relatively weak fundamental demand for corrugated containers and rising capacity. However, despite these negative trends, the overall business benefitted from an approximate $100/ton price increase in major containerboard grades and an increase in box prices as well. The biggest concern entering 2014, other than the basic strength of the global economy, is the impact of a surge in new capacity, which could throw a monkey wrench into the works.

The rise in prices and a muting of input costs — at least for a while as OCC prices fell to very low levels earlier in 2013 — were certainly noteworthy developments last year in the containerboard market. In April, a $50/ton increase was successfully passed on to converters that raised linerboard prices to about the $650/ton range. This was the second successful increase in an eight-month period, following a $50/ton increase that was enacted in September 2012. These increases significantly improved operating margins for the major producers.

Containerboard mills were able to push through the increases despite several important indicators that wouldn’t seem to support an upward movement in prices, i.e. weak domestic demand for corrugated boxes, a steady decline on OCC costs and a long term over supply situation in the box market. The increase was successful mainly due to the sweat and hard work on the part of board producers who took significant market-related downtime to keep inventories under control and the market balanced. At the end of the year and into early 2014, prices are reported to have held mainly steady despite somewhat weak box cut ups during the seasonally slow months of the year again due to downtime that sustained operating rates.

As noted, OCC costs fell steadily from a peak almost $180/ton in late 2011 before bottoming out at about $100/ton in early 2013. Since then, prices have posted a modest rebound but remain low. Many observers believe that as global containerboard demand accelerates in 2014, OCC prices will surge and this may provide the impetus for prices to also rise further on liner and medium grades this year.

U.S. box and containerboard data through November 2013 clearly demonstrate the impact of sluggish economic job and personal income growth on the box market. For the first 11 months of 2013, box shipments were down 0.5% vs. the prior year at 331.2 billion square feet year-to-date, and down 2.5% vs. November 2012 levels. On an average week basis, which accounts for a different number of ship-
ping days month to month, November box shipments were up 2.6%, according to FBA and AFPA data. Total containerboard production, at 31.9 million tons, was up 1.6% over the first eleven months vs. the prior year level, but down 4.5% in November vs. last year.

**Export Markets Cooled in 2013**

The export market continues to be an important market for U.S. mills, with linerboard exports through November at 3.5 million tons according to AF&P. However, this is down 0.6% vs. 2012 levels. While demand in some export markets has weakened the drop is also partly due to mills in North America diverting tonnage to domestic markets. The export market has appeared to be weak in recent months, with export prices reported to be down in Europe and weak in Latin America. The weaker pricing is a result of a slowdown in demand plus an excess of supply in several regions including North America and Europe.

U.S. Bureau of Census data through the first three quarters of 2013 showed U.S. Kraft linerboard exports down 6.3% at 2.8 million tons vs. the same period in 2012. Exports to the largest U.S. export market, Western Europe, were off nearly 20% at 585,000 tons. Exports were also down significantly to Canada, while smaller drops were posted for Mexico, the Middle East and Africa. In contrast, exports to Central America and South America, at 438,000 tons and 439,000, were up by 3.6% and 11%, respectively, vs. 2012 levels. In turn, export prices are reported to have slipped as well in Europe and were under pressure in the fourth quarter in Latin America.

**New Capacity a Concern**

As noted, significant new capacity came online in the second half of 2013 that is a cause for concern, but reportedly, so far, it hasn’t had a severe impact on the market. This includes tonnage from the startup of Norampac’s new 330-inch, 525,000 tpy recycled linerboard machine at the Greenpac mill in Niagara Falls, New York and the conversion of two newsprint machines to containerboard. This includes the addition of 150,000 tpy of linerboard by SP Fiber in Dublin, Georgia, and 300,000 tpy by Atlantic Packaging in Whitby, Ontario.

The converted paper machine in Dublin has a 390,000 tpy capacity, but the net gain is 150,000 tpy because of switching another machine at the mill from board to newsprint. Combined, the new machine and conversions added nearly one million tons of new capacity. All three machines came online in the 2nd and 3rd quarter of 2103. The impact of this tonnage, much of which was just beginning to hit the market late in 2013, is a major concern in 2014. Pratt also announced plans to build a 360,000 tpy containerboard mill by its box plant in Valparaiso, Indiana.

**Box Demand and Consumer Spending**

Probably the biggest unknown in the outlook for containerboard is box demand. The reasons behind the relatively poor performance recently in box demand is fairly obvious: a sluggish U.S. economy in combination with weak job growth and poor growth in personal income resulted in weak growth in consumer spending. This is particularly true for key markets that consume a lot of corrugated board such as food and beverage. With sluggish or no growth in disposable income over the last few years, consumers spent less on packaged food and beverages. These uses are critical for box plants as they account for just under half of total U.S. box shipments. Major food companies also reported lackluster results, mirroring the poor performance of corrugated boxes.

**Looking Ahead**

Looking forward into 2014, there is hope that the U.S. and European economies will perform better than they did in 2013, and this could provide a modest boost in box demand. Many economists believe that the U.S. economy could expand at closer to a 4% rate this year vs. weaker growth pegged at about 3% in 2013, which is coming on the heels of 2.8% and 1.8% growth in GDP in 2011 and 2012, respectively. Similarly, Europe’s GDP fell in 2012 and was expected to post little or no gain in 2013. However, projections call for modest growth in the Euro area economy in 2014.

Notable structural changes in the containerboard market in recent years, and which continued in 2013, will also likely impact the market’s supply and demand balance as well as the direction of pricing. Major mergers and acquisitions, including two major ones in 2013, have resulted in the top five containerboard producers now accounting for 75% of U.S. capacity. The most recent deals closed last year include Kapstone’s $1 billion acquisition of Longview Fibre and PCA’s $2 billion acquisition of Boise. Kapstone’s deal moved the company into the No. 5 position in North American containerboard capacity, behind International Paper, RockTenn, Georgia-Pacific and PCA.

A rebound in the U.S. economy and thus improved box demand would be of great benefit to producers, who wouldn’t have to continue to take downtime and also would result in higher operating rates. It would also go a long way in accommodating the recent capacity that has been added and allow producers to maintain a more balanced market. Given the recent weakness and new capacity it’s unlikely any major movement in prices can be expected early this year.

However, if the U.S. and global economy improves, and input costs such as for OCC begin rising, producers are likely to seek additional increases later in 2014.

Harold Cody is a contributing writer for PaperAge. He can be reached by email at: Hcody@paperage.com.
Quiet Start in Europe

The European paper industry is off to a relatively quiet start in 2014, and industry observers say the year may continue as such, which may be a good thing.

By David Price

It’s hard to spot unless you’re a chemist in an industry lab, where there’s a lot happening in cellulose and nanotechnology. Or if you build with wood you’re doing well here in Europe. I contacted the top five European pulp and paper companies, spoke with two consultants, and attended two major conferences (Hawkins Wright and European PaperWeek). The conclusion: not a lot is happening. Yes, Domtar just completed its acquisition of the Spanish personal care products manufacturer Indas, and Double A of Thailand (formerly Advance-Agro) has announced plans to restart the Alizay pulp mill that sits next its paper mill in France, but that’s about it.

Bits and Pieces

Yet there is some significant and positive action in recycling, security papers and tissue. The industry has successfully lobbied the European Parliament to block a proposal by the EU to reclassify wastepaper — the vote was 606 “for” and 77 “against.” This proposal would have classified wastepaper as “recycled” even before it’s been recycled! The vote in Strasbourg will save more than 20,000 ‘green’ jobs in the industry and 140,000 indirect jobs in Europe. If this legislation had passed it would have relaxed the EU’s waste management rules and triggered a flight of wastepaper from the EU to Asia, pushing up prices in Europe and undermining the quality of wastepaper available to the EU recycling industry. The consequences could have been devastating. Paper recycling in Europe would have dropped from 47 million tpy to 37 million tpy, leading to mill closures and the disappearance of hundreds of recycling operators.

In a symbolic act in September 2013, CEPI temporarily dumped bales of wastepaper in front of the EU’s headquarters in Brussels to draw attention to the problem. So now it’s back to the drawing board to try and solve the problem of when does paper cease to be classified as waste?

It so happens that, at present in Europe, sourcing good quality recycled fiber is becoming a problem, especially for the tissue sector.

Paper or Plastic?

The Bank of England (BoE) has decided to replace British bank notes with plastic (polymer) notes. The job was expected to go to either De La Rue, the existing maker of BoE notes, or Innovia, which manufactures most of the polymer notes around the world. The Bank promised a consultation process last October but by January it was a done deal with Innovia. The Bank has ruled out importing plastic money from China.

Mark Carney, formerly the Governor of the Bank of Canada, is now Governor of the BoE. While Governor of the Bank of Canada he introduced in 2011 a change of paper to plastic for $100 bills. Canada has since gradually
switched to plastic $50, $20, $10 and $5 bills. They say a plastic bank note is tougher to counterfeit, lasts longer and can be cleaned. But I also hear that vending machines must be upgraded in order to accept them. Bottom line: the Bank of Canada says they’re here to stay. If this is the future of bank notes in the UK, what will happen to the traditional British printers and producers of security papers? It will be a massive blow said one manufacturer who did not want to be named. A consultant to the industry told me it will be a big hit on this specialist sector, but it will survive as De La Rue and others are major suppliers of paper bank notes to countries all over the world.

The money and ownership trail of Innovia is fascinating. It is an off-shore company and its owners plan to sell it to Pamplona Capital Management, a fund backed by the Russian billionaire, Mikhail Fridman. The Guardian newspaper commented, “If the Bank thinks it unacceptable for British currency to be in Chinese hands, are Russian hands any more acceptable?”

Reusable Diapers

Despite the biggest baby boom in the UK in 40 years, sales of diapers have fallen nearly 4% in the last year. Sales of Pampers (P&G), which dominates the UK market, have fallen by 4.1% according to the trade magazine The Grocer. The UK diaper market is worth $800 million a year and Pampers sold 76.3 million fewer diapers last year despite its biggest rival, Huggies (Kimberly-Clark), exiting the UK and European market last October. K-C’s shock exit closed mills in UK, Italy, Spain and Poland with the loss of 1500 jobs.

Consultants think the drop in sales is due to middle class households doing their bit for the environment and families switching from the big brands to cheaper diapers from the discount retailers as household budgets shrink. Own-label products are up by 37.3% and volume sales have risen 44.5% But P&G, SCA and the Italians — with 7 million tpy of tissue production in Europe — seem unfazed by this trend.

I’m not convinced there’s a long term market for reusable diapers. I think it’s fashionable and green and will not last. If you think through the detail of cleaning, separating and reusing a soiled diaper, the technical and hygienic issues are considerable. And there is solid evidence the tissue makers are rethinking their use of recycled fiber in their products and are turning, increasingly, to virgin fiber.

David Price is a contributing writer for PaperAge. He can be reached by email at: DPrice1439@aol.com.
Dryer performance audits have been used for years as part of efforts to optimize the papermaking process. These audits involve quantifying dryer performance indicators and comparing the indicators to performance standards. Some of the traditional indicators are not easily applied since they require special measurement techniques and a highly experienced assessor. Others are easily applied and are valuable to optimization efforts.

Five easily applied dryer performance indicators that provide a good indication of dryer section energy efficiency include:

- Hood exhaust humidity
- Dryer section supply air flow relative to dryer section evaporation load
- Dryer section supply air temperature
- Energy losses from the steam system relative to total steam dryer steam consumption
- High pressure motive steam consumption as a percent of total dryer section steam consumption

Commonly applied standards for these indicators, the reasoning behind the standards, and considerations related to assessing the indicators are highlighted in the following discussion.

HOOD EXHAUST HUMIDITY

TAPPI standards specify the exhaust air drawn from the dryer section hood be 0.04 to 0.07 kg w.v./kg d.a. (300 to 500 grains) for “open” type hoods, 0.13 kg w.v./kg d.a. (900 grains) for “medium humidity” closed type hoods with fully enclosed basements, and 0.17 kg w.v./kg d.a. (1200 grains) for “high humidity” closed type hoods. Operating a hood with excess exhaust (and too low a humidity) lowers the air temperature surrounding the sheet, dryers, and dryer fabrics. It also increases the radiation and convection heat losses and reduces the effectiveness of heat recovery equipment.
installed on the hood exhaust systems. Operating a hood with insufficient exhaust positively impacts energy efficiency, but it risks operational problems such as dripping on the sheet, corrosion of equipment, and spillage of heat and humidity to the machine room.

Hood exhaust humidity can easily be assessed by inserting a wet and dry bulb thermometer into the hood exhaust flow stream. For an accurate measurement of wet bulb temperature, the air velocity passing across the wet bulb should be greater than 3 m/s. Many dryer sections operate with inappropriate amounts of exhaust. Figure 1 shows average hood exhaust humidities for several recently measured operating paper machines.

**DRYER SECTION SUPPLY AIR FLOW RELATIVE TO EVAPORATION LOAD**

The rate of hot air supply to the dryer section should be appropriate for the rate of evaporation from the dryer section. If it is not, there is opportunity to save energy or improve drying performance.

Most paper machines are operated with a heated supply air system serving the dryer section. The delivery of heated supply air to the dryer section lowers the relative humidity of air surrounding the sheet and drying equipment. Nearly all dryer sections that operate with no form of dryer section supply air system are unfelted dryer sections that lack felt rolls. On dryer sections with dryer fabrics, having heated supply air is normally necessary to avoid felt roll corrosion.

TAPPI standards specify pocket air humidity be between 0.12 to 0.28 kg w.v./kg d.a. For high-speed machines making lightweight grades, excessive air supply to dryer pockets can negatively affect web stability. For machines that do not have problems with sheet flutter, it is suggested the air supply to the dryer section target a humidity of 0.20 kg w.v./kg d.a., which is the median of the recommended humidity range by TAPPI. To achieve this pocket humidity, the amount of air that must flow into the dryer pocket is 4.2 kg d.a./kg evaporation.

To assess the supply air flow rate per unit evaporation, both the dryer section evaporation load and the total supply air flow rate must be assessed. The dryer section evaporation load can be quantified with a simple drying rate calculation.

(See TAPPI TIP 0404-24 for guidelines on calculating the evaporation load.) The total supply air flow rate to the dryer section should be assessed with field measurements. For most hot air supply systems, the best method for measuring flow rate involves using a vane anemometer at the face of air intakes.

**DRYER SECTION SUPPLY AIR TEMPERATURE**

Assessing supply air temperatures for pocket ventilation systems is normally easy. If online indication does not exist, temperatures can be easily measured with a thermocouple probe inserted into the supply air stream. The TAPPI recommended supply air temperature for dryer section supply air systems is 82 to 93°C. Temperatures significantly lower than this range are usually inappropriate since they increase risk of condensation, dripping, and corrosion of equipment. Temperatures significantly above this range are usually inappropriate since they significantly increase energy demand while providing little benefit.

**ENERGY LOSSES FROM THE STEAM SYSTEM**

An energy efficient steam system operates with few losses. By far, the easiest way to assess the energy efficiency of a steam and condensate system is to quantify steam losses from the system and compare them to total dryer section steam consumption. Alternative methods of assessing steam system energy efficiency, which include evaluating steam consumption per unit evaporation or steam consumption per unit production, have clear shortcomings. Realize that the waste steam flows that hurt steam system energy efficiency are normally small relative to total dryer section steam consumption. When quantifying steam consumption
energy efficiency – dryer section

<table>
<thead>
<tr>
<th>Dryer Performance Indicator</th>
<th>Recommended Level</th>
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<tbody>
<tr>
<td>Hood exhaust humidity</td>
<td>0.04 to 0.07 kg w.v./kg d.a. for an “open” hood</td>
</tr>
<tr>
<td></td>
<td>0.13 kg w.v./kg d.a. for a medium humidity closed hood</td>
</tr>
<tr>
<td></td>
<td>0.17 kg w.v./kg d.a. for a high humidity closed hood</td>
</tr>
<tr>
<td>Dryer section supply air flow relative to dryer section evaporation load</td>
<td>5 to 7 kg d.a./kg w.v.</td>
</tr>
<tr>
<td>Dryer section supply air temperature</td>
<td>82 to 93°C</td>
</tr>
<tr>
<td>Energy losses from the steam system relative to total steam dryer section steam consumption</td>
<td>Total combined steam losses less than 3% of total dryer section steam consumption</td>
</tr>
<tr>
<td>High-pressure motive steam consumption as a percent of total dryer section steam consumption</td>
<td>4 to 8% of total dryer section steam consumption</td>
</tr>
</tbody>
</table>

Paper machine dryer sections are a thermocompressor type system. This system uses high-pressure motive steam for recompressing blow-through steam. For those mills that have steam-driven turbine generators, high-pressure steam is more valuable than turbine exhaust steam. The high-pressure steam can be passed through the turbine generator so that relatively inexpensive thermal energy is converted to a more valuable electrical energy. For mills with turbine generators, the paper machine dryer section should draw as high a percentage as possible of its total steam demand from headers being fed by turbine generators, or has only partially passed through turbine exhaust steam. The high-pressure steam can be passed through the turbine generator so that relatively inexpensive thermal energy is converted to a more valuable electrical energy. For mills with turbine generators, the paper machine dryer section should draw as high a percentage as possible of its total steam demand from headers being fed by turbine generators, or has only partially passed through turbine exhaust steam. The high-pressure steam that has not passed through turbine generators, or has only partially passed through turbine generators to an intermediate extraction point.

Potential methods for reducing motive steam consumption include:

- Replacing inefficient thermocompressors with properly sized high-efficiency units.
- Upgrading rotary syphons to stationary syphons
- Improving the accuracy of differential pressure transmitters so that differentials can be minimized.
- Actively managing differential pressures as a function of machine operating conditions so that excessive differential pressures are avoided. This is best done through application of supervisory control logic.

The dryer section is a large consumer of energy, but ensuring it is operating efficiently is not difficult. By assessing only a few easily applied “dryer performance indicators”, one can determine whether large improvement opportunity exists.

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Microbiological Auditing and Control – A New and Powerful Approach to Controlling Problem Organisms

A genetic-based technique used to detect and identify troublesome microbes in paper mills’ fresh water systems has been found to be quick, accurate, and less cumbersome than traditional methods.

By David Oppong and Tod Stoner

Editor’s Note: This article was first presented at PaperCon 2013.

Fresh water contamination of paper mill systems may lead to outbreaks of deposits of filamentous bacteria often collectively called “pink slime.” These deposits can be difficult to treat with modern microbiological control programs, especially in mills where corrosion is a concern. We have adopted a methodology that uses DNA fingerprinting to identify problematic fresh water organisms. Once the microorganism is isolated and identified, we can then use our available biocidal actives to identify the most appropriate formulations so that the deposit can be effectively treated. Even though problem organisms can manifest in similar ways, specific problem organisms can vary widely in the optimum product and MIC required to control them.

Thus, by utilizing the state of the art technology to identify problem organisms, we not only provide our customers with some of the most advanced control chemicals, but the resulting information is also entered into a database where it can be retrieved to help identify and treat problems found in other mills.

INTRODUCTION

The problems caused by uncontrolled growth of microorganisms in the production of paper are well known. These include odor, paper stains, web breaks, slime, blockage of pipes, and corrosion. Microorganisms enter the production system from a variety of sources such as raw materials, water, soil, and air. The control of microorganism is usually accomplished with the use of biocides and/or dispersants as well as good housekeeping including boil out of the system where appropriate.

In preparation for effective microbial control of a system, a good audit of the system helps as this can give a picture of the types, nature, and the relative abundance of the microorganisms that may be causing the problem. The use of the
microscope, visual inspection, ATP assays, and also microbial plate counts are some of the techniques frequently employed in the auditing process.

DNA methods for detecting and identifying microorganisms have become increasing popular. DNA methods for detecting and identifying microorganisms have become increasing popular. They have been used in the leather industry, pulp and paper and have played significant roles in expanding our knowledge of the microbial flora of these environments. It would be advantageous if some of these techniques could be incorporated into microbiological auditing programs and routinely used to detect and identify troublesome microbes in paper mills.

In this presentation, we describe a genetic-based identification technique that we have found to be useful and which we frequently employ together with the other established auditing tools when we initiate microorganism control in a system. We also present the use of these techniques in studying the “pink slime bacteria” in deposits from six different mills.

**SAMPLING AND ISOLATION OF BACTERIA**
The first step in using DNA based auditing method involves selection of sampling points. Typically, we obtain samples from several points of interest including water and slime deposits. Samples of slime deposits and incoming water are collected and sent to the laboratory for microbiological analyses. The samples are processed immediately after arrival at the laboratory. Samples are aseptically processed by serial dilution in sterile saline and plated on plate count agar, R2A agar, Stokes agar, and actinomycetes isolation agar. The plates are incubated at 30°C or 45°C-50°C (depending upon field conditions) for 2-7 days and colonies picked, and re-streaked to obtain pure cultures of bacteria. The isolation could also be done by streaking the original samples onto appropriate plates, but we usually use the serial dilution method as this also affords us the chance to estimate the relative numbers of bacteria that may be causing the problem.

**DNA PREPARATION**
The genetic method for the identification is based on the MicroSeq system from Applied Biosystems, Foster City, California. The method requires the use of DNA from pure cultures of bacteria. The DNA is extracted from the cultures using the instructions provided in the PrepMan Ultra Sample Preparation Reagent Protocol (Applied Biosystems).

**GENE AMPLIFICATION**
Once DNA is obtained, a polymerase chain reaction (PCR) is run. PCR is a method for amplifying or making millions of copies of a particular gene sequence. In identifying eubacteria, the 16S rRNA gene is amplified. This gene is used in the identification of most bacteria because it is expected to occur in all bacteria. The 16S rRNA gene is also conserved which means it has changed very little over the evolutionary period. Additionally, the 16S rRNA gene has regions of significant sequence variability that allows bacteria of different species to be differentiated or identified.

A PCR reaction mixture would include the template DNA, primer set to initiate the reaction, thermostable DNA polymerase, nucleotides (dNTP’s), magnesium, and a buffer. All reagents and method for amplifying the 16S rRNA gene are contained in the MicroSeq 500 16S rDNA Bacterial Identification PCR Kit (Applied Biosystems).

At the end of the reaction, the success of the PCR is checked by taking a sample of the reaction mixture and running agarose gel electrophoresis. If the expected band can be visualized on the gel, the PCR is deemed to be successful and the product is cleaned up of the unreacted reactants.

**16S rRNA SEQUENCING AND DATA ANALYSIS**
The cleaned amplified DNA is used in cycle sequencing. DNA sequencing is a method that allows us to determine the order or sequence in which the bases (A, T, G, C) occur in a particular gene or DNA. Cycle sequencing utilizes four different fluorescent dyes to covalently label the corresponding bases in the DNA.

16S rRNA gene sequences of the isolates are generated using the MicroSeq 500 16S rDNA Bacterial Identification Sequencing Kit (Applied Biosystems). After cycle sequencing, the reaction mixture is cleaned up to remove unreacted reactants and unincorporated dyes according to the method provided by the manufacturer.

The reaction products from the cycle sequencing are then electrophoresed on an automatic DNA sequencing machine. Sequence analysis and bacterial identification are performed using Applied Biosystems’ MicroSeq microbial analysis and database. In a case where there is no match, a BLAST search of the GenBank or Ribosomal Data Project is conducted for a possible match.
RESULTS AND DISCUSSION

A genetic-based identification system was used to study the composition of “pink slime bacteria” in pink slime deposits prior to instituting slime control programs. The samples came from mills located in the US, China, Germany and the Czech Republic. Detailed identification of the culturable bacteria was done for samples obtained from three of the mills. For the remaining samples, attempts were made to isolate only pink-or-red-pigmented bacteria. Table 1 shows the bacteria identified in the deposits from the various mills.

In the six mills studied, the main cause of pink slime varied to include Flectobacillus sp, Runella sp, Meiothermus ruber, Deinococcus geothermalis, and Serratia marcescens. Flectobacillus sp. are pink-pigmented filamentous bacteria. In this work we found them in three of the mills studied. This study, coupled with our experience from many other studies, indicate that they are the main cause of pink coloration in many “pink slimes” in modern paper machines. In one mill, Flectobacillus sp. were found together with Rhodovarius lipocyclicus which were red-pigmented but short rods. Rhodovarius sp. have been found in other places but no information about their occurrence in the paper mill environment could be located.

In one of the mills, the cause of the pink slime was found to be Runella sp. These are filamentous bacteria and they have been isolated in a wastewater treatment plant and water bodies, but neither information about their occurrence in paper mills nor their association with “pink slime” in paper mills has, to date, been published.

Meiothermus ruber and Deinococcus geothermalis were identified as the cause of the pink slime in one of the mills studied. In this mill, Meiothermus ruber was found to be the dominant pink or red-pigmented bacteria. These organisms are moderately thermophilic and they were isolated at 45 - 50˚C. The presence of Meiothermus sp. and Deinococcus geothermalis in slime deposits and as the cause of red or pink slime in paper machines has previously been reported.

In the 1950s, Serratia sp. were commonly associated with pink slime in paper mills, but many studies in recent times have shown many different bacteria other than Serratia sp. as the cause of this problem. Interestingly, in one of the mills in the current study, Serratia marcescens was the dominant pink- or red-pigmented bacteria found and the cause of pink slime outbreak in that mill (Figures 1 and 2). Possible reasons why Serratia sp. have become rare in recent times have been explored and these included changes in machine design and operation, paper making technology, furnish types, biocides, and other additives.

Table 1. Composition of “pink slime bacteria” from deposits from 6 different mills

<table>
<thead>
<tr>
<th>Mill 1 (US)</th>
<th>Mill 2 (US)</th>
<th>Mill 3 (Germany)</th>
<th>Mill 4* (Czech Republic)</th>
<th>Mill 5* (China)</th>
<th>Mill 6* (US)</th>
</tr>
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<tbody>
<tr>
<td>Flectobacillus sp.</td>
<td>Runella sp</td>
<td>Flectobacillus sp</td>
<td>Meiothermus ruber</td>
<td>Serratia marcescens</td>
<td>Flectobacillus major</td>
</tr>
<tr>
<td>Ralstonia sp.</td>
<td>Sphingomonas sp</td>
<td>Caulobacter sp</td>
<td>Deinococcus geothermalis</td>
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<tr>
<td>Janthinobacterium sp.</td>
<td>Bacillus cereus</td>
<td>Aquaspirillum</td>
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<tr>
<td>Aquitalea sp.</td>
<td>Acinetobacter anitratus</td>
<td>Acinetobacter anitratus</td>
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<td>Asticcacaulis extrincus</td>
<td>Cytophaga sp</td>
<td>Pseudomonas resinovorans</td>
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<td>Burkholderia sp.</td>
<td>Chromobacterium violaceum</td>
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<td>Herbaspirillum sp</td>
<td>Klebsiella pneumoniae</td>
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<td>Sphingomonas sp.</td>
<td>Staphylococcus epidermidis</td>
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<td>Uncultured/ Unidentified bacteria</td>
<td>Asticcacaulis extrincus</td>
<td></td>
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<tr>
<td>Uncultured/ Unidentified bacteria</td>
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</tbody>
</table>

*Study was designed to isolate only pink-or red pigmented bacteria.
Furthermore, a number of bacteria were isolated and the 16S rRNA gene sequenced but could not be "named" as these bacteria either may not have been fully characterized, or may not have been cultured in the laboratory before. These were designated "uncultured/unidentified." One interesting and unique thing about the use of sequence-based identification in auditing is that the sequences of these "uncultured/unidentified" bacteria can be stored in a searchable database and used in future searches. This database and experience of how to control these bacteria provide a ready tool in the event of pink slime outbreaks.

In conclusion, the identification system described in this study was found to be quick, accurate, and less cumbersome than the traditional methods. It allowed a large number of isolates to be identified in a relatively short period of time. The 16S rRNA gene sequences for the organisms are stored in a database which can easily be searched when the need arises. Additionally, the susceptibility of most of these microbes to various control agents have been determined (no data reported in the current work) and this information, among others, is used in making timely decisions about appropriate control strategies for a particular situation.

LITERATURE CITED

David Oppong is Senior Biotechnology Research Scientist, and Tod Stoner is Product Specialist - Deposit Control at Buckman. For further information, please contact David Oppong: d_oppong@buckman.com.
Keep it Running Smooth

To succeed in today’s fiercely competitive marketplace, pulp and paper manufacturers positively, absolutely, require maximum equipment availability and productivity from their machinery, and a disciplined lubrication management program can make this happen.

By Tom Schiff

Whether your mill is producing pulp, printing and writing grades of paper or containerboard, maintaining a safe work place, complying with applicable laws and producing profitable products with maximum quality are all sound objectives for a world-class company. But, what does it take to accomplish these objectives? To be successful, manufacturers like yourself positively, absolutely, require maximum equipment availability and productivity of your paper machines and auxiliary equipment. To make that happen you need a disciplined, world-class lubrication program. This can be achieved by establishing some guiding principles that include:

1. Setting the importance of a lubrication management program.
2. Defining the lubrication management program goals, and...
3. Implementing the tools required to achieve the lubrication management program goals.

THE IMPORTANCE OF A LUBRICATION MANAGEMENT PROGRAM

Most people believe just maintaining or adding lubricant to the rotating equipment provides effective lubrication. However, by not implementing lubrication program management, the opportunity to optimize equipment reliability and maximize the return on your investment may be lost. Disciplined lubrication management is the foundation of a world-class lubrication program. The following chart illustrates the difference made in a plant’s total cost of ownership once you’ve taken that step.

Remember that implementing a disciplined lubrication management program comprises only one part of an overall equipment reliability improvement program. Sound preventive/predictive maintenance activities combined with good maintenance planning, scheduling, and execution are also key to delivering maintenance improvements.
LUBRICATION MANAGEMENT PROGRAM GOALS

To properly define the goals of your lubrication management program, use the following list. Choose those goals that will best meet your company’s needs:

- Reduce lubricant related failures
- Use the fewest correct lubricants and minimize waste
- Apply the lubricant in the correct manner, at the proper time and in the correct amounts
- Integrate the plant’s preventive and predictive maintenance goals into the lubrication program
- Continually investigate and implement methods to improve and achieve the above goals

Once you’ve defined the goals of your lubrication management program, next you need to be sure you have the proper tools that will enable you to achieve these goals.

BASIC TOOLS REQUIRED FOR AN EFFECTIVE PROGRAM

No single program works for everyone. There are many different methods to achieve the goals of your lubrication management program. No matter what method you implement, to ensure success, you should use the following tools.

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<th>DESCRIPTION</th>
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<th>AFTER</th>
</tr>
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<tr>
<td>Annual Lubrication Costs including Labor, Lubricant Costs and Supply Costs</td>
<td>$1,055,000</td>
<td>$845,000</td>
</tr>
<tr>
<td>Total Annual Maintenance Budget</td>
<td>$24,000,000</td>
<td>$22,000,000</td>
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<tr>
<td>Percent Annual Lubrication Costs vs. Total Maintenance Budget</td>
<td>4.4%</td>
<td>3.80%</td>
</tr>
<tr>
<td>Lost Annual Availability Due to Scheduled and Unscheduled Maintenance</td>
<td>6%</td>
<td>2%</td>
</tr>
<tr>
<td>Estimated Annual Profit Lost due to Lost Equipment Reliability</td>
<td>$3,500,000</td>
<td>$1,200,000</td>
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<tr>
<td>Annual Maintenance Department Overtime</td>
<td>22%</td>
<td>14%</td>
</tr>
<tr>
<td>Annual Number of Equipment Failures Due to Poor Lubrication</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>Annual Volume of Lubricant Consumed (gallons)</td>
<td>62,000</td>
<td>15,000</td>
</tr>
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</table>

Note: Table shows example numbers for demonstration purpose only.

Most people mistakenly believe just maintaining or adding lubricant to the rotating equipment provides effective lubrication.

Leadership. First and foremost, lubrication needs to be a priority for maintenance managers. Many companies look at lubrication on a price basis and strive for methods to minimize that cost. Unfortunately, when this happens, you may run the risk of forfeiting the true payback that can result from optimizing your lubrication program — improved equipment reliability AND decreased overall maintenance costs. Be sure to nominate a program champion — someone who will assume the responsibility, accountability and control for the program. Plan for continual improvement and measure your progress on a regular basis.

A good program requires dedication, skill and accountability. The discipline to “stick with it” comes from strong leadership.

Standard Operating Procedures (SOPs). Like other disciplines (operating or repairing machinery), SOPs can help guarantee repeatability and quality work. Also, SOPs assist in the training of lubricators and enable you to track and communicate equipment condition.

Teamwork and Communication. A world-class lubrication program must have a team that works and communicates with all members of the manufacturing group opera-
To continually improve, both program leader and lubricators must continually learn best lubrication practices, as well as learn new techniques in their specific discipline.

To handle the quantity of data encountered (even for a small plant), an effective computerized system should be employed. Without the aid of computerized data management, important equipment trends may be missed and/or documentation of the lubrication program may be lacking.

Training. To continually improve, both program leader and lubricators must continually learn best lubrication practices, as well as learn new techniques in their specific discipline.

Metrics. Knowing the past performance and understanding the effects of program efforts enable you to make and evaluate lubrication program-related decisions. The following metrics are useful when tracking your program’s progress (other metrics not listed below may also prove useful).

- Total maintenance costs and percent spent on lubrication
- Percent of equipment scheduled and unscheduled downtime
- Number of lubricant related failures
- Percent of maintenance overtime labor
- Lubricant consumption
- Safety Incidents

Audits. In order to improve, you need to validate or audit your lubrication program. Whether performed internally or by a third party, the effort to benchmark and evaluate your lubrication program against other “best in class” operations will supply tremendous dividends. The science of lubrication audits can become very involved, however, and deserves a paper of its own.

CONCLUSION

Safety, compliance, and maximum quality manufacturing are sound objectives for a world-class company. A disciplined lubrication management program is what’s needed to achieve these objectives. And, when you set goals that put in place the tools you need to succeed, you are well on your way to establishing a world-class lubrication program.

Tom Schiff is Americas Field Engineering Manager for Exxon Mobil Corporation. He has nearly 20 years of experience with ExxonMobil and for 8 years has held the positions of Reliability Engineer and Maintenance Superintendent for a prominent paper producer. For further information about lubrication management, please visit: www.mobilindustrial.com/ind/english/contactus.aspx.
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Continuous Commitment to Paper Recovery for Recycling

Paper recovery has fostered a dynamic marketplace that allows recovered fiber to find its highest-value use, which helps to encourage even more recycling.

By Donna Harman, President and CEO, American Forest & Paper Association

Recovering paper and paper-based products for recycling has long been a priority for our industry and an effort in which AF&PA members continue to be proven leaders. Since 1990, when we first set a nationwide paper recovery goal, the U.S. recovery rate has nearly doubled, topping 65 percent in 2012. According to the U.S. Environmental Protection Agency, in 2011, only 27.6 percent of glass, 20.7 percent of aluminum and 8.3 percent of plastics were recovered from municipal solid waste streams.

Recovering paper products extends the fiber supply, which allows our industry to reuse its products to make new ones. It also saves an average of 3.3 cubic yards of landfill space for each ton of paper recycled.

AF&PA member companies have taken efforts to develop and nurture a voluntary, market-driven system that fosters consistently high rates of paper recovery. Our sustainability initiative — Better Practices, Better Planet 2020 — includes a goal to exceed 70 percent recovery of all paper used in the U.S. by the year 2020. Our members continually take strides to improve the recovery of paper and paper-based packaging.

The paper recycling industry collects, sorts and processes recovered paper into new paper and paper-based packaging products that were valued at $8.4 billion in 2012. And the value of U.S. recovered paper exports totaled $3.5 billion in 2012. All in all, paper recovery has fostered a dynamic marketplace that allows recovered fiber to find its highest-value use, which helps to encourage even more recycling.

But paper recovery for recycling is a collective effort. Ultimately, it is possible and successful thanks to the commitment of millions of Americans who make the effort to recycle at home, work and school every day.

We recognize excellence in paper recovery for recycling through our annual AF&PA Recycling Awards program.

First launched in 2006, the AF&PA Recycling Awards recognize and highlight businesses, schools and communities that increase paper recovery through educational, innovative and cost-effective programs and partnerships. The program generates interest in developing new recycling programs; provides a resource to those looking to start or improve paper recovery programs; and supports the industry’s on-going effort to increase recovery and maintain the quality of recyclable paper.

Now in its ninth year, the AF&PA Recycling awards program has been redesigned and continues to provide great visibility and reward those engaged in successful paper recycling efforts.

In each category — school, business and community — there are now four chances to win. Programs will no longer be judged for their all-over performance, but on specific characteristics, namely: volume — the total amount of paper and paperboard collected; creativity — unique and innovative ways that have been used to market the program, raise awareness and generate interest; participation — unique and innovative ways successful programs increased participation and tonnage collected; and partnerships — innovative partnerships with communities, businesses and/or non-profit organizations used to promote increased recovery.

This structure will allow for a greater focus on elements that drive improved paper recovery program performance and increase recovery overall. It will also allow us to expand our reach and provide opportunities for more parties to engage and enter the program.

Descriptions of the awards, entry criteria and entry forms are all available on paperrecycles.org. The deadline for all entries is March 7, 2014.

Our industry has a proud tradition of achievement in paper recovery for recycling, and we are looking forward to recognizing the invaluable involvement of businesses, schools and communities in making paper recycling a success. Paper offers a recyclable product made from a renewable resource, which is one of many strong points that makes paper the choice that consumers can trust and be proud to use.
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Valmet's services cover everything from maintenance outsourcing to mill and plant improvements and spare parts. Our strong technology offering includes entire pulp mills, tissue, board and paper production lines, as well as power plants for bio-energy production. Valmet and Metso will continue to work closely together to offer winning automation solutions.

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