

SPECTRUM

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MAGAZINE OF PULP & PAPER 

WORLD-CLASS PM6

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ANDRITZ
Pulp & Paper

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NEW PRODUCT DOLPHIN ROTOR

Dolphins in the screenroom? A new rotor design for pressurized screens – the Ro-Tec Dolphin™ rotor – is now available from ANDRITZ. The rotor is gentle on fibers, but the major benefits are higher capacities and lower specific energy consumption. Energy cost savings up to 50% (compared to conventional rotors) have been achieved.

The foils on the Ro-Tec Dolphin™ can be adapted for different production environments and applications. It is suitable for new screens or retrofit applications. Additional benefits are decreased risk of clogging, increased throughput, and a long, durable lifetime.

The new rotor is demonstrating its capabilities in more than 80 installations in 2009. In addition to energy savings, pulp cleanliness was either maintained or improved in every installation.

Find out more by contacting pulpandpaper-service@andritz.com



Proof of commitment

There is no question that we are continuing to experience tough times in the global Pulp & Paper industry. Yet, we are beginning to see some signs of life – in pulp and paper pricing, acquisitions, environmental stimulus programs, and the announcement of capital projects moving forward.

You can read about some of these new projects on the following pages. They demonstrate our capabilities to support customers in cutting their investment and production costs. More importantly, the stories highlight technologies newly developed by ANDRITZ PULP & PAPER:

- New paper packaging line (including automation) at Hebei (page 4)
- New biomass gasifier at Skive (page 16)
- New wash press at Skutskär (page 20)
- New energy-saving LC refiner at Braviken (page 28)
- New BioPower boiler at Navia (page 34)

Developing something NEW – even through a recession – is proof of a commitment to the industry. It requires an active R&D program and serious investment. An extension of this commitment is the ability to lower CapEx costs and accelerate start-up curves for faster paybacks (see Fibria story on page 10). In the area of fast paybacks, the low-cost automation solution documented on pages 24-26 will be of interest to you.

As Rikard Wallin, Mill Manager at Braviken put it, "We know that times are tough for the machine suppliers. It's not a walk in the park for anyone. So we really appreciate the commitment and support."

Right now there is hot discussion about stimulus programs for the industry. Regardless of the politics, it is clear that there is a growing demand for less energy consumption and more green energy production. We have developed the right products and technologies to help with this – and our R&D will continue to focus in this area.

Humbert Köfler
Member of the Executive Board
Pulp & Paper – Service and Units

Karl Hornhofer
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Competence and confidence in northern China

The start-up of a new packaging paper line more than doubled Hebei Yongxin Paper Co. Ltd.'s capacity in China, making it one of the main players in the growing northern Chinese market. For ANDRITZ, it was an impressive entrance as a supplier of complete packaging paper machines – including all the auxiliaries such as stock prep and automation.



Wu San Luo, General Manager of Hebei Yongxin, is looking forward to the future with confidence, even as competitors are building new mills in his region during 2009. The main markets for Hebei's packaging materials are close by where several customers have their converting operations.

"Our customers include joint ventures like Kangshifu instant noodles, Mengniu milk, Yili milk, Zhenyuan Packaging for Nokia, Motorola, etc.," Wu says. "Principally, we sell to all the packaging producers. The total market in northern China is about two million tonnes per year, and the demand for high quality products is increasing each year."

Wu believes that the decision to purchase a complete production line (PM6) from ANDRITZ was fully correct. "Although the start-up was only two months ago, many customers have already acknowledged the

increased quality and good value produced by PM6," Wu says. "Hebei is now facing the interesting challenge that market demand from the new line is exceeding our production."

Hebei Yongxin Paper is now the largest containerboard producer in northern China and is positioned among the 15 largest paper companies in China. The mill is very open for visits, allowing any potential ANDRITZ customer to visit them. Companies from Europe, China, and other Asian countries have already traveled to the mill, which is about a three-hour drive from Beijing.

Why invest in the north, as the main market still seems to be in the south? Ma Ping, ANDRITZ's Sales Manager China for Paper Machines, as well as Project Coordinator for ANDRITZ, has his own observations: "In the early 1990's, the Pearl River Delta region developed very fast and



▲ PM6 is 5.6 m wide (trim width) and designed for 1,100 m/min. PM6 will bring Hebei's total capacity to 700,000 t/a, making it the largest containerboard producer in northern China.

there was a huge need for packaging material," he explains. "Later on, there was good growth in the Yangtze River Delta region. In order to balance economic development, the Chinese government started promoting the Economic Circle around the Bohai Sea in 2000, and hopes that it will become the third leg of economic development in China. After the start-up of PM6, Hebei Yongxin is now the number one kraftliner producer in this Economic Circle."

International standards

Wu says that Hebei Yongxin chose ANDRITZ after many technical and commercial discussions. He himself started at Jiangxi Paper Industry Co. in the 1970's and that is when he first came in contact with ANDRITZ, during discussions about a new deinking line. "We wanted a high level pro-

duction line at Hebei Yongxin produced to international standards," he says. "At the same time, ANDRITZ wanted to expand its offerings in the paper machine market. We knew that ANDRITZ produced good stock preparation and approach systems, and good tissue machines. So, we believed they could also provide a good packaging paper machine. The results fully proved this to be true."

Hebei chose ANDRITZ to supply all the systems, including stock preparation, the machine approach system, the machine itself, and the automation. ANDRITZ was also chosen as the general contractor and service provider for the whole project. The contract was signed in March 2007 and erection began in June 2008.



▲ The dryer section is both single-tier and double-tier and is equipped with a calender, a film press, and an air turn.

"Although the start-up was only two months ago, many customers have already acknowledged the increased quality and good value produced by PM6."

Wu San Luo, General Manager of Hebei Xongxin



Hebei's paper reels in the storage facility adjacent to the new PM6 building. ▶



▲ The majority of the furnish is recycled fiber. Hebei has established wastepaper collection companies in Beijing, Tianjin, Harbin, and Shenyang. ANDRITZ delivered three stock preparation lines with a production capacity of 1,570 t/d and the approach system. ▶



Screens and cleaners in the ANDRITZ stock preparation plant. ▶



A huge joint effort

The two-year project was a huge joint effort coordinated by ANDRITZ. About 2,500 individual components were sourced and manufactured locally in China, and another 1,850 components were shipped from Austria. In addition to components manufactured by ANDRITZ Technologies Ltd.'s workshop in Foshan, 19 Chinese sub-suppliers and 31 from Europe were involved in the project.

"ANDRITZ people have been at our site to supervise the installation, commissioning, the start-up, and now the optimization phase." Wu says. "All discussions about the details have been carried out in a very smooth way. These discussions have all had the same target – to bring PM6 into optimum production."

Efficient and environmentally friendly

PM6 started up April 6, 2009. It adheres to the proven ANDRITZ PrimeLine design concept, featuring the most efficient equipment needed to produce high-quality packaging paper.

Wu remarks that, "For the paper machine, ANDRITZ provided advanced technology, including hydraulic headboxes with dilution control, shoe presses, a film press, and a calender, all of them at the same high technical level as those of the other top suppliers."

The ANDRITZ scope of supply started with the complete stock preparation system and approach flow system. The machine itself has a multi-layer PrimeForm former and a PrimePress X shoe press. The

dryer section is both single-tier and double-tier and equipped with a calender, a film press, and an air turn. The PrimeReel is capable of winding parent rolls up to 3.6 m diameter. Apart from the stock prep and paper machine, ANDRITZ also supplied the automation package: plant and quality control systems coupled with the condition monitoring and hydraulic and pneumatic control systems.

The machine can produce kraftliner in the 100-200 g/m² basis weight range. Current production is in the 110-175 g/m² range. The line has a capacity to produce 400,000 t/a of kraftliner or linerboard, which increases annual production capacity of Hebei Yongxin to more than 700,000 t.



"After the start-up of PM6, Hebei Yongxin is now the number one kraftliner producer in this Economic Circle."

Ma Ping, ANDRITZ's Sales Manager China for Paper Machines

"Our new PM6 is world class, and it is equal to any such paper machine worldwide," Yuan Youming, Vice Chief Engineer and Production Manager for PM6 says. "Throughout the project and now through the optimization phase, ANDRITZ has made engineers and specialists available. It has significantly enhanced the PM6 to perfection, and they have taught us several things about how to fully obtain the value from this new machine."

Environmental issues were also kept in mind when planning the new production line. The Chinese government has tightened restrictions on water consumption and COD discharge. According to the new standards, all effluent must go to a biological treatment plant, and the paper machine water consumption must be below 20 m³/t of product.

"The high technology used in the PM6 production line has reduced water consumption to seven cubic meters per tonne" Wu says. "Compare this to our existing PM5 which uses 15 cubic meters per tonne. Also, steam consumption is reduced, thanks to the shoe presses. Additionally, the high level of automation (about 8,000 I/Os) helps save energy."

"Our new PM6 is world class, and it is equal to any such paper machine worldwide."

Yuan Youming, Vice Chief Engineer and Production Manager for PM6





◀ ANDRITZ's machine includes a multi-layer PrimeForm former and a PrimePress X Twin. A PrimeReel is used for winding parent rolls up to 3.6 m maximum diameter.

The PrimeCoat Film is used for surface sizing and pigmented coatings. ▼



Like virgin

Yuan says that the end-products from the new line, thanks to ANDRITZ's advanced stock preparation technology, look like they were made from virgin pulp, even though the furnish is recycled fiber.

PM6 has three pulp lines with a production capacity of 1,570 t/d: a mixed wastepaper line of 1,000 t/d, an old corrugated container (OCC) line of 350 t/d, and a 220 t/d wood pulp line.

Currently, the company obtains mixed wastepaper in China from its own raw material collecting companies. "We established wastepaper collection companies in Beijing, Tianjin, Harbin, and Shenyang as part of this project," Yuan says. "They provide 1,000 tonnes per day for the mill. We also import around 15,000 tonnes of OCC from the USA, and about 4,000 tonnes of kraft pulp each month from South America."

"The new stock preparation equipment from ANDRITZ breaks down the wastepaper in a

gentle way and can extract the long fibers from OCC, enabling the PM to make the highest quality A-grade linerboard, which is a kraft topline," Wu says. "This has better strength properties than the lower quality grades. Internally, the yield is high and the whole process is consistent and very energy-efficient."

A complete production chain

In northern China, big cities generate wastepaper in huge amounts but there are not many major packaging material producers. This was one of the main reasons why the company owners and investors wanted to build a new packaging paper line.

Jin Guoming, President of Hebei Yongxin explains the ownership structure: "Hebei Yongxin Paper was established in 2003," he says. Today, Hong Kong Wing Fat Printing Co. Ltd. (printing products for the packaging industry) owns 80% and Tianjin Xinnan Trading Co. Ltd. (wastepaper collection) owns 20% of the shares."

Christoph Kogler, a Process and Control Engineer for ANDRITZ Automation, fine-tunes the DCS. ANDRITZ delivered the complete package of control systems and condition monitoring system for the new PM6 line. ▶

Operators from Hebei work with the ANDRITZ Automation system on PM6. ▼



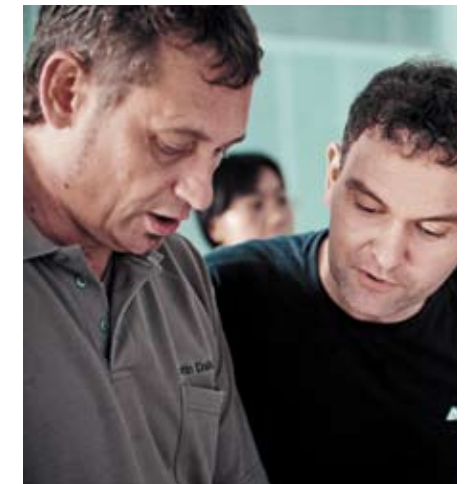
Forging forward together

ANDRITZ Küster's Martin Dahlmann, who has been on site at the Hebei facility as Service Supervisor for two months during the optimization phase, says that the operators and maintenance team at the mill have become very familiar with the new PM6 regarding the new technology, maintenance, and production.

"What I find most impressive with the PM6 specialists is their enthusiasm and drive to learn," Dahlmann says. "They ask pertinent questions and are always willing to try new things. The cooperation between our team and Hebei Yongxin has been outstanding even through the language barrier... yet with the help of our translator we are able to forge ahead without any major hindrances."

"What I find most impressive with the PM6 specialists is their enthusiasm and drive to learn."

Martin Dahlmann (left), Service Supervisor from ANDRITZ Küsters



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THE ANDRITZ SCOPE

PrimeLine paper machine:

Wire width: 6.2 m

Design speed: 1,100 m/min

Capacity: over 400,000 t/a

- Final product: kraftliner and linerboard
- Headbox with dilution control
- PrimeForm SW former
- PrimePress X Twin shoe press
- Complete dryer section with calender, film press, and an air turn
- PrimeReel

Stock preparation and approach flow system:

- FibreSolve pulping system, cleaning and screening, fractionator, dispersion, thickening, and refining.
- Three separate approach systems
- Save-all and broke system
- Under machine pulpers

ANDRITZ Automation:

- Complete DCS system for the entire production line, QCS, and condition monitoring system
- Service for start-up, commissioning and remote maintenance



Growth on the horizon

The economic crisis prompted a period of reflection in Brazil to reaffirm that their growth strategies still made sense. The answer turns out to be a resounding “Yes!” with the formation of Fibria, the start-up of the world’s largest single fiberline, and plans on the drawing board for additional greenfield projects.



“A start-up still gets the adrenaline running – especially when you first pump chips to a 3,900 tonne digester or put that pulp on a big 9.3 meter drying machine!”

Guilherme Araújo, Fibria’s Fiberline Production Manager

Guilherme Araújo (left), with Newton Kozak, ANDRITZ Project Manager.

“Speed of thinking and speed of production are critical to our future,” says Francisco Valerio, Director of Industrial Operation and Engineering of Fibria, the new company formed by the merging of VCP and Aracruz in Brazil. “This is not a time to slow down.” (see side interview on page 15)

In some organizations, speed can lead to mistakes. But it is hard to discern any mistakes in Fibria’s Horizonte Project – a massive greenfield 1.3 million t/a bleached market pulp mill line recently started up near Três Lagoas in southwest Brazil (Mato Grosso do Sul state).

If you had to name a greenfield project that has been fully vetted and scrutinized, Horizonte would come to the top of the list. The land for plantations and a potential mill site was purchased by Champion International (which became part of International Paper in 2000). Trees were planted and plans were developed for a new mill – and there were several false starts.

Then in 2006 things moved forward at a quick pace. IP announced that it would exchange its pulp mill project at Três Lagoas (together with the surrounding planted forests) for VCP’s Luiz Antonio mill and its nearby forests. In addition, IP would build a new 200,000 t/a paper machine adjacent to the greenfield pulp mill, with VCP providing pulp and utilities to the machine.

Groundbreaking took place in December 2006 and pulp started flowing from Project Horizonte in March 2009. After this, VCP introduced itself to the world as Fibria, merging its operations with Aracruz Celulose and forming the world’s leading market pulp producer (5.8 million t/a production capacity).

Smoother start-up than Veracel

Could it be that these Fibria people have

become so used to building and starting up large greenfield mills that they take it for granted?

“No, not at all,” says Guilherme Araújo, Fiberline Production Manager at Três Lagoas. “A start-up still gets the adrenaline running – especially when you first pump chips to a 3,900 tonne digester or put that pulp on a big 9.3 meter drying machine! But let’s just say that we have total confidence in our team and suppliers that allows us to remain calm and focused.”

Upon coming to the project in 2007, Araújo’s main tasks were to select his operating team and prepare for commissioning and start-up. The team consists of about one-third seasoned veterans for the control room and two-thirds young people training to become operators. Most of these new people are from the local region and have never seen a pulp mill before. “The IDEAS Simulator from ANDRITZ has been an important tool for us because of these new people,” Araújo



ANDRITZ provided the stock preparation system, drying machine, and automated baling line. Shown is the wet end of the dewatering machine. ▶

A close-up of the dewatering machine shows the press section of this 9.3 m wide machine. ▼



Room to grow. The production line features a single fiberline (left) and a drying/baling plant (right) all supplied by ANDRITZ. With this 1.3 million t/a mill ramping up production, plans are starting to add a second line beside it. In the background are part of Fibria’s plantations which surround the mill. ▼



says (see sidebar story about the IDEAS Simulator on page 13).

“All the technical and commercial decisions were made before I got here,” Araújo says, “but this is not a problem for me. It’s the third fiberline project in a row that I’ve worked on involving ANDRITZ equipment. Each time I learn something – and it’s reassuring to know that ANDRITZ learns each time as well. I would say that this start-up was much smoother than even the one at Veracel.”

Completely calm

“At the end of April 2007 we bought big packages from ANDRITZ (fiberline, drying/baling plant, and white liquor plant),” says Valerio. “Twenty-three months later, we started up this plant and the ramp-up was fantastic. What was most remarkable to me was to walk into the fiberline and drying machine control rooms two days after start-up and see how the operators were acting. The atmosphere was like this mill had been operating for years. So calm.”

Prime production

Within the first 30 days, Três Lagoas reached 50% of its design capacity, and it is continually moving up the learning curve. “We are today above 90%,” Valerio

says. “This August we produced 99.5% prime pulp. September it was 100% prime. I’ve been working in this industry for 40 years and to reach 100% is an outstanding achievement. We are really very proud about the ramp-up and the quality.”

According to Araújo, “From the beginning we have not had a problem regarding quality parameters such as brightness or viscosity or cleanliness. I’m not just talking about lab tests, because we have one customer over the fence (IP) that is consuming our pulp at the rate of 280,000 tonnes per year. They are very happy.”

In October, the performance test run for the ANDRITZ drying and baling plant was successfully completed. Performance guarantees were met and, according to Araújo, a new production record was set at 3,643 admt/d. “Not bad for a plant designed for 3,450 tonnes per day!” he smiled.

Building during a boom

This is not to suggest that everything in the project went perfectly from day one. “A project would not be a project without daily challenges,” Valerio says.

One of the main challenges was that all the purchases were made during a boom time

in the industry. “This created a lot of difficulties for us,” Valerio says, “as steel prices, construction prices, and labor prices were at a high. Suppliers’ workshops were full and everyone was busy. We had to cut the frills and stick with the best proven technologies.”

Newton Kozak, ANDRITZ’s Project Manager from Curitiba, Brazil, also points to the logistical challenges of working in an interior state such as Mato Grosso do Sul. “It’s about 700 km to the ocean ports where shipments come in,” he says. “In addition, there was a strike by federal customs employees. Locally, the state’s customs of-

ficials had not dealt with pulp and paper components before. This caused shipments to be held at the border while officials agreed upon the import/tax classifications for components coming from China, Sweden, Finland, Germany, the USA, and Austria.”

“We’ve had a few small difficulties, but the results have been fantastic,” Valerio says. “We are very proud of our results – no doubt.”

Designed for expansion

Marco Iáconis is one of Fibria’s Project Engineering Coordinators and was a pro-



“The process design here is very nice. Nowadays I think that ANDRITZ has proven itself as having the best fiberline technology – especially in bleaching.”

Marco Iáconis, Fibria’s Project Engineering Coordinator

Murilo Sanches da Silva, Operation Supervisor for the white liquor plant (left), Alexandre Oliveira, Project Engineer (center), and Fernando Pereira, Utilities & Recovery Manager walking in front of the new ANDRITZ LimeKiln™. ▼



cess design consultant for the Horizonte project. “This was originally planned to be a 900,000 tonnes per year mill when IP was going to build it,” he says. “But we found that with very little additional investment, we could reach 1.3 million tonnes.

“The process design here is very nice. Nowadays I think that ANDRITZ has proven itself as having the best fiberline technology – especially in bleaching. They have more experience and more knowledge for these projects.”

What once was the lay-down area for the construction crews stands empty today, but not for too long. Fibria has already announced its intent to build a second line at Três Lagoas, hopefully in less than five years, if the markets hold.

Like coming back from a shutdown

One of Fibria’s people involved in mechanical commissioning was Daniel Rubega. “I love doing something completely new,” Rubega says. “It’s very exciting to create something where there is nothing.” Gesturing around the mill site, Rubega makes his point. “Before 2006, there was nothing here but eucalyptus trees.”

Rubega and his team performed the pre-commissioning, cold commissioning, and

hot commissioning of the equipment prior to the actual start-up. “We didn’t really have what I would call a classic start-up,” he says. “It was more like coming back from a shutdown. Operators walked into the control rooms, sat down, activated the DCS, and things just worked.”

When asked about working with the ANDRITZ team, Rubega was quite sincere. “The ANDRITZ people are like real partners,” he says. “They are always open to discussions and ideas, very transparent, and a pleasure to work with. There is confidence and competence on both sides.”

Friends with responsibility

ANDRITZ also delivered the lime kiln and recausticizing plant for Project Horizonte. For Fibria, this area of the project was managed by Alexandre Oliveira.

“We have good modern equipment in the white liquor plant and it is operating very well,” Oliveira says. “The overall production capacity is 12,000 cubic meters per day of white liquor.”

The LimeKiln™ is the largest in South America (5 meters in diameter and 145 meters long) and is rated for 960 tonnes per day. The recaust plant has two LimeGreen™ green liquor filters and a LimeDry™ lime mud filter with 14 discs. Of special interest to Oliveira is the LimeWhite™ white liquor filter which is a new prototype design with the lime mud vessel inside. “This reduces the space requirements,” he says. “We are working with ANDRITZ to perfect the design.”

“ANDRITZ has been very simple to work with,” Oliveira says, “though I must admit that I’ve worked with them since 1994. I consider them good friends – but friends with responsibility. They take this responsibility seriously.”

“I can honestly say that we all worked as one team on this project,” Valerio says. “It was like everyone worked in the same company. The same level of teamwork and commitment remained from engineering, to

Overall production for the ANDRITZ white liquor plant is 12,000 m³ per day. The LimeKiln™, designed to produce 960 t/d of lime, is the largest in South America. ▶



SIMULATING SUCCESS

“I know that complete automation is a goal and not always the reality,” says Edevar Lopes of Fibria. “But that is my motivation – to make the plant work like a symphony.”

Edevar Lopes, Automation Specialist for Fibria



Lopes finds it exciting to work with automation systems in a heavy industrial environment. “There are other places I could work with my 16 years instrumentation and programming background, but none as challenging as this mill.”

One of the challenges in a greenfield start-up is preparing the operators to take over control of the mill even though the equipment is not yet installed. Lopes and his team used the IDEAS Simulator from ANDRITZ as a key training tool.

“The dynamic process Simulator is used for at least two distinct tasks,” Lopes says. “First is to verify control loops and checkout the DCS before start-up. By doing this, we virtually eliminate problems with integrity of control loops so that we know the DCS will perform well. This can be done weeks before we actually go online.”

Task two is operator training. In the case of Três Lagoas, the IDEAS Simulator was configured for the fiberline, kiln/causticizing, evaporation, recovery boiler, and power boiler. Experienced operators worked on the Simulator for two and one-half months, and new hires four months in order to prepare for start-up. “The screen of the Simulator is exactly like the screen on the DCS,” Lopes says. The mathematical model is so accurate, there is no difference to the operators between operating a virtual digester and the real one.”

What about feedback? “The best feedback is at start-up,” Lopes says. “During a normal start-up, operators will come to us constantly with questions or small problems. You know, a control loop not controlling or not understanding something on the DCS. Not here. We actually got a little lonely waiting for them to call. It’s amazing how smooth this was!”



▲ Two views of the ANDRITZ fiberline at Três Lagoas. Left: The single-vessel continuous digester is currently ANDRITZ's largest. Right: Large DD washers are employed for washing and bleaching.

checkout, to commissioning, to start-up." Fernando Pereira, Utilities & Recovery Manager, has a similar opinion. His responsibilities include the power, recovery, water, and wastewater systems for the mill. He has been involved with the Horizonte Project from the beginning, coming to the site from VCP's Jacareí mill.

"We had a manufacturing problem with the kiln's drive gear when it was first installed," Pereira says. "I was impressed with how quickly ANDRITZ came to action. They changed out the gear as quickly as possible and we've been running well ever since. What we're doing now is pushing each piece of equipment to its maximum so that we know our limits. We'll make design production, but I would always like to get more!"

There is no one at Fibria who disagrees. While they are getting accustomed to starting up large greenfield lines that their peers in other countries can only dream about – they are also accustomed to delivering maximum production at the lowest possible cost. They choose their technology partners carefully – and then work side-by-side to reach their goals.

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José Alves, Process Specialist for Cellulose Production (left), Cirio Nishi, ANDRITZ Fiberline Process and Mechanical Supervisor (center), and Daniel Rubega, Maintenance and Commissioning Engineer, check a flowsheet in the fiberline area. ▼



INTERVIEW WITH FRANCISCO VALERIO STABLE, SUSTAINABLE, AND SOCIAL

Francisco Valerio is Director of Industrial Operations and Engineering for Fibria. He has a 40+ year career in pulp and paper, which gives him a unique perspective.

"It's a different industry than when I started 40 years ago. Stable production has always been a goal. But now, equally important are sustainable production and a commitment to be socially responsible.

The work is challenging and exciting. We have better tools, technologies, and better opportunities to connect with people. One of my favorite things is to sit down in the control room and talk to the operators. I have never been disappointed – they always have good ideas on how we can improve.

Supplier relationships. If you make a bad capital investment, you never get cash value-added from it for the rest of your life. That's why you need to be sure when you decide about technology. I've joked that if you get married and it doesn't work out, you can change your wife. But, when invest in a major piece of technology, you will have it for the rest of your life! (Editor's note: Valerio has been with the same woman for 43 years).

The start-up. To have the Horizonte Project start up so smoothly is a tribute to the entire team – Fibria, ANDRITZ, and other suppliers working together. Remember, Três Lagoas is the largest single-line mill in operation. In an area where there was no other big industry or infrastructure, we were able to achieve this fantastic start-up. We used an outside facilitator (Align Corporation) to follow this project and keep everyone on track. We also did a thorough checkout and commissioning because we know the consequences of starting without everything being checked out completely.

I've seen some projects where the engineering group and the suppliers say to the operators, "Hey, the mill is ready – now it's



"In an area where there was no other big industry or infrastructure, we were able to achieve this fantastic start-up."

Francisco Valerio, Director of Industrial Operations and Engineering, Fibria

ity rating. Several days we have produced more than the design 3,450 tonnes per day on the drying machine.

Fibria. Fibria is the largest market pulp producer, with about 12% of the world's production. When we talk hardwood, we are talking 22%. And, if only eucalyptus is considered, our production represents 37% of global production. Our customers use our pulp for tissue (52%), printing/writing (25%), and 23% for specialties. Geographically, we sell about 10% of our production in Brazil, 30-35% in Europe, 25-30% in North America, and 35% in Asia.

Our biggest challenges are to reduce our investment costs and to always have sustainable projects. It's not desirable to have a nice forest surrounded by communities where the people are very poor. The communities must have a possibility to grow, a place where children can receive a good education, and where everyone can have a better life.

yours." Not at Três Lagoas. Our engineers are staying to the end of the year to follow the progress and help the operations people. Their financial incentive is not just for the project, but to get the mill to full, stable production.

Production. I would say that Três Lagoas has the best technology available. We knew from the first week of operation that the mill can achieve what it is designed to. We have already operated for two weeks at a rate to support 1.3 million tonnes on an annual basis. We pushed each major system just so we know the limits. For example, we pushed the digester and found the point where the steam at the top is at the limit, and it's above the 4,150 tonnes per day nominal capac-

Future plans. Over the next decade, just from Fibria, we are planning three big projects. Within 10 years, I would expect our production to be around 10 million tonnes per year. In addition, much of our development work concerns silviculture today. We have tripled the productivity of our forests since the 1970's, but the new discussion is about tonnes of pulp per hectare. Now, we are in the range of 11-12 tonnes. We are thinking 14 tonnes. Why not? For example, we can improve the fiber ratio between cellulose and lignin. We can improve the density.

We are learning all the time, we can improve all the time. That's what makes it interesting!"

First-of-its-kind at Skive

Gasification technology has long held the potential to use biomass more efficiently, especially in combined heat and power applications. The potential has come closer to reality with the start-up of a novel demonstration project in Denmark.

“Biomass gasification has now moved from the pilot plant to the real world,” says Kari Salo, Managing Director of ANDRITZ Carbona, specialist in gasification technology. At I/S Skive Fjernvarme, a first-of-its-kind installation – where fuel feeding, pressurized gasifier, tar reformer, gas cooler, and scrubber are all operating together outside a laboratory – is now operating in commercial scale. ANDRITZ Carbona provided this technology to produce fuel gas from wood-based biomass for combined heat and power (CHP) production.

A single bubbling fluidized bed (BFB) gasifier and related equipment converts wood pellets to fuel gas for three reciprocating en-

gines in a combined heat and power (CHP) in the CHP plant. The engines generate electrical energy (two MW each) from which the heat is recovered for the community’s district heating needs. Two gas boilers in the facility can also utilize the biomass-derived gas providing additional district heat.

The project is financed on a commercial basis, but as it is a demonstration facility, subsidies are provided by the EU, the US Department of Energy, and the Danish Energy Agency.

Gasification is best solution

“Cogeneration of electricity and heat at district heating plants raises our overall ef-



▼ The ANDRITZ Carbona gasifier is a pressurized bubbling fluidized bed (BFB) design.

I/S Skive Fjernvarme in northern Denmark produces 120,000 MWh of district heating and 22,000 MW of electricity for about 8,500 households and businesses. ▼



First-of-its-kind installation. Fuel feeding, pressurized gasifier, tar reformer, gas cooler, and scrubber all operating in commercial scale.

“The efficiency of converting the energy in the fuel,” says Jens Ole Skov, Operations Manager for I/S Skive Fjernvarme. “In a smaller scale CHP plant like this, the electrical efficiency must be maximized to make the plant economically feasible. Gasification enables us to produce about 30% more electricity than a conventional steam process. In total, the efficiency of our CHP operation is about 90%.”

In addition to being the owner, Skov’s company also acted as the general contractor for this EUR 23 million investment project. “This is the biggest project by far that we have ever managed and it has stretched our resources very thin,” Skov says. “We have relied very heavily on the technical and engineering expertise of ANDRITZ Carbona.”

The scope of ANDRITZ Carbona’s supply includes fuel feeding, BFB gasifier, the gas cleaning system, and equipment for gas cooling and distribution. GE Jenbacher AG of Austria supplied the three engines specifically developed for low-calorific gas combustion.



“Cogeneration of electricity and heat at district heating plants raises our overall efficiency of converting the energy in the fuel.”

Jens Ole Skov, Operations Manager for I/S Skive Fjernvarme

Andras Horvath (left), Director of Technology for ANDRITZ Carbona and Jens Ole Skov in the CHP plant.



▲ Two gas boilers at the plant can also utilize the product gas from the gasifier to produce additional district heating.

The plant is expected to produce 6 MW electricity and 11.5 MW district heat from 19.5 MW of wood pellets. The maximum fuel input of the plant is 28 MW, allowing for the generation of additional district heat. Besides providing 70% of the district heating production for 8,500 households in the community, the facility will also produce 40 GWh of electricity annually.

New and exciting work

"This project has given us the opportunity to explore the operational challenges and the lessons to be carried forward," says Andras Horvath, Director of Technology for ANDRITZ Carbona. "We are learning every day."

Gasification itself is a proven technology, according to Horvath. ANDRITZ Carbona originally acquired the BFB technology from the Gas Technology Institute in the USA in 1989. "It was originally used for coal gasification and we modified it for biomass," Horvath says. "We've been developing it ever since."

The technology that is newest is the catalytic reformer which handles the tars developing during wood gasification. "The catalyst is relatively new, and the big unknown is the actual life of the catalyst," Horvath says.

"Also, no one has ever integrated all these systems in commercial scale before. It is all new and exciting, studying the performance of scaled-up equipment."

Skov agrees. "This is by far the most interesting and exciting project I have been involved with," he says. "But as an operations guy, my goal is to get this plant running in auto as quickly as possible."

Automatic operation is a must, according to Skov. He supervises the operations of eight district heating facilities for the company and all run attended overnight and weekends. "So, we are testing, measuring, optimizing, and automating – all at the same time!"

Commissioning of the plant started in late 2007 and, using one gas engine, operations began in the summer of 2008. The second and third gas engines were installed in 2008 and are now all in operation. In the summer, district heating requirements are minimal, so the engines were not needed. By regulations, the plant cannot be used solely for electricity generation (even though the plant would profit from the green energy credits), so cold weather is welcome to fully test the system.

Aerial view of Thorsvej district heating plant (I/S Skive Fjernvarme) in Denmark. ▼



"What we know so far is that there is very low tar content in the product gas compared to circulating fluidized bed technology," Horvath says. "There are no heavy tars which might condense in the system."

Integrated design

The Skive plant can utilize wood pellets or chips. Currently, pellets are fed through two lock hopper systems into the lower section of the gasifier's fluidized bed. The air-blown gasifier is operated at a maximum of 3 bar over pressure and 850° C temperature. Dolomite is used as the fluidized bed material.

Before the gas can be used as fuel in the engines, several steps must be completed. First, is the gas cleaning step which uses a novel catalytic technology to reform the tar compounds in the gas to hydrogen and carbon monoxide. The product gas contains about 22% carbon monoxide, 20% hydrogen (H₂) and 5% methane (CH₄) by volume, and has a heating value of about 5 MJ/kg. By way of comparison, natural gas has a heating value of about 40 MJ/kg.

Next, the gas is cooled and passed through filters to remove dust. The gas is then scrubbed with water to cool it further. "The



▲ The engine room: three reciprocating engines operate on the biomass-derived fuel from the ANDRITZ Carbona technology.



▲ Denmark is aggressively applying renewable energy solutions and was the first in the world to start up this CHP plant with biomass gasification.

maximum gas temperature for the engines is about 40° C," Skov says, "so the gas must be cooled considerably. The heat removed from the gas in the gas cooler and scrubber is used to generate district heat."

Now the gas is ready for use in the engines or in the two gas boilers, or flared off in a possible emergency situation. The heat from engine cooling (lubrication oil and jacket cooling) and the exhaust gas is recovered for the production of district heat.

Commissioning, start up, and operations

Hot start-up of the ANDRITZ Carbona gasifier occurred late in 2007. The start-up was performed in a stepwise fashion, according to Horvath, with the gasifier, gas cooler, filter, and gas boiler processes operated independently to verify the integrity of gas production. Once the systems were supplying gas to the boilers and delivering district heating to the hot water network, the tar reformer and scrubber were added to the gas cleanup line and commissioned.

Product gas quality was measured in detail to ensure it met all the criteria for impurities and contaminants specified by engine supplier. The first engine achieved full load, grid-connected operation after a few days.

Operators in control room. The facility is designed to run on auto-pilot nights and weekends, so there is a high level of instrumentation and control. ▼



"The results show that the system design is highly suitable for this type of application," Skov says. "The raw gas quality and heating value corresponds well with the original design requirements. The gas cleaning system has been tested and the required gas quality has been achieved."

Demonstration plant challenges

Still, the path from a pilot plant to a commercial scale plant is a difficult one. "The team from I/S Skive Fjernvarme has worked extra hard on this project and it has been great to cooperate with them," Horvath says.

"We are meeting the technical and operational challenges one by one," Skov says. "We knew there would be obstacles since this is a first-of-its-kind facility. As owners, we want to produce cheap electricity and heat for our stakeholders. ANDRITZ Carbona wants to demonstrate and prove new technology. Together we are managing to overcome our challenges and demonstrate the feasibility of this new technology."

AWP removes washing bottleneck

Stora Enso's Skutskär mill is the first to test-drive a new washer design from ANDRITZ. "It's very forgiving and works well" is the first reaction from Skutskär's Fiberline Production Engineer.

It was at the 2008 SPCI exhibition in Stockholm that ANDRITZ introduced its new AWP wash press. In addition to highlighting the technical merits of the new design, Mikael Forslund, Senior Vice President and Division Manager, revealed that the first AWP had already been sold – to Stora Enso's Skutskär Mill in Sweden.

The AWP is now operational and we recently had an opportunity to visit with Lasse Aspelin, Fiberline Production Engineer at Skutskär, and Göran Bröttgårdh, Product Manager, and Johan Sjöberg, Process Specialist, from ANDRITZ. Aspelin gave a tour of the mill and talked about the performance of the AWP since its start-up in June of this year.

Skutskär: always improving

Skutskär was established over 100 years ago and is a sulphate pulp mill producing about 540,000 t/a of bleached pulp and fluff pulp from birch and softwoods. "We have three digesters, three bleach plants, and four drying machines (two for baled pulp and two for fluff pulp)," Aspelin says. "We are one of a few producers of fluff pulp in Europe."

Recently, Stora Enso shut down the nearby Norrsundet pulp mill and Skutskär will acquire some machinery from it and the Kemijarvi mill. "It is tragic when a mill shuts down, but it's good that we can reuse equipment," says Aspelin. "We have old drum filters here that we can retire when we install the ANDRITZ DD washers from

the other mills. The future double oxygen stages will improve our fiber quality and environmental impact even more."

The evolution of the AWP

"We were discussing with ANDRITZ a service package for one of our bleach plants and, half-jokingly, told them that if they wanted to build a new wash press and put it somewhere, we would take it," Aspelin says. "They already had plans to build one, so we began to have serious discussions."

Two very old wash presses at Skutskär were limiting the capacity on Line #1. With a new wash press, Skutskär could maximize production and pump surplus pulp to Line #2 so they could fully utilize the digester. "The digester should be at maximum production," Aspelin says.

Tight fit. The AWP takes up a very small footprint in the mill. Here it is shown sandwiched between two old presses at Skutskär (one on the left side and one behind it).



▲ The ANDRITZ AWP. "The difference is in the details."

"While ANDRITZ has a portfolio of washers, there are applications where customers want to have filtrate extraction (water lock) for example," says Bröttgårdh. "The AWP can boost inlet consistencies of 2-8% to outlet consistencies above 30% while delivering clean pulp to the next process stage."

Modern design tools were used to develop the AWP, as well as simulation routines to optimize the drum design, vat geometry, and filtrate extraction. "Saying that a washer is a washer is much like saying an automobile is an automobile," Bröttgårdh explains. "They are similar in looks and function, but the differences in details can be quite substantial."

ANDRITZ presented its design to Skutskär. A contract was signed in May 2008 and erection began in May 2009. The agreement was that ANDRITZ would use the time from start-up (June) to fall shutdown (November) to test the wash press, make modifications, and do whatever was needed to perfect the design.

A perfect fit?

"We designed the AWP for retrofit and upgrade applications where the 'footprint' is at a minimum," Bröttgårdh says. "The Skutskär case was tighter than most."



"The AWP is perfect for the production we need."

Lasse Aspelin, Fiberline Production Engineer at Skutskär

"We wanted to run the old presses in parallel so that ANDRITZ could have the ability to modify the AWP if needed," Aspelin says. "The AWP design, with its larger diameter drum, but shorter length, is perfect for the 840 admtd/d production we need."

Sjöberg describes the situation. "Our first layout had the AWP beside one of the old presses," he says. "But then the problem was how to divide the pulp from the AWP into the two feeding lines for the old presses. This would require conveying screws and a distribution plate to separate the pulp – much too complicated. Then we took a look at whether we could fit the unit between the two old presses and it made more sense. But it is a tight fit."

"We knew the press would work, or ANDRITZ would do whatever it took to

make it work," Aspelin says. "Our concerns were centered around the special solution for pulp discharge, and how the pulp would react in the oxygen reactor."

No fears

Bröttgårdh explains. "With an ordinary press, you take out the pulp on one side," he says. "Here we take the pulp out on both sides and feed it through an extra long shredding screw into a pressurized reactor. If we don't do it right, with the right consistency, we could get a backblow, which could be quite a mess. Also, if we don't deliver the pulp evenly on both sides, we will not have even plug flow to the oxygen stage."

"We knew that we would have to live with this special solution for almost a year," Aspelin says. "If it hadn't worked, we would be in

trouble. The pulp flow has been well distributed and split evenly to both sides, but a mid bearing in the long shredding screw has caused some problem.”

The other unknown factor was how the pulp would react in the oxygen reactor. “With this type of oxygen stage, unlike an MC stage, you mix when the pulp is at 28% consistency, and it just lays on tables inside the reactor,” Aspelin says. “If you don’t get it mixed right in the beginning, you get uneven pulp out of the reactor. We are seeing a reduction in kappa number, so we know that our solution is working. Future plans are to have a traditional discharge screw connected to an MC oxygen stage.”

Looking good

“There are advantages and disadvantages to being the first,” Aspelin says of the mill’s decision to install the first AWP unit. “You can usually get a little reduced cost, and you have the advantage of the new technology when it works right. But sometimes you have to live with what I call child diseases, the small things that go wrong during any new product development.

“In fact, I was quite surprised. The first week when we started up the AWP, we had one plugging incident. At that time, our operators had not learned how to react when they saw a disturbance coming to the press, so they just waited it out. But after that it ran for three straight weeks and it ran extremely well. I didn’t think it would go so smoothly.”

And, the parallel operation of the old presses?

“The old presses are not running very often,” Aspelin says. “Only when ANDRITZ wants to do something with the AWP. This press is very forgiving and can handle upset situations or disturbances easily. Runnability of this unit has been quite nice. You just push the button and it starts up.”

ANDRITZ is completing its tests of wash losses and efficiencies. “The thing that we can see right now is that the old presses were not really wash presses – they were only presses,” Aspelin says. “The AWP actually washes the pulp and what we can see in the oxygen stage right after the AWP is



▲ Johan Sjöberg, Process Specialist with ANDRITZ, takes a sample of pulp after it is processed by the AWP and before it enters the oxygen stage.

better kappa reduction. Our target now is to find the right running strategy to keep the production efficiency up all the time.”

“What we know from this first installation is that the design is sound,” Bröttgårdh confirms. “The key features and geometries are correct. We verified the design with computer models – but the proof is in the real world.”

“The production increase we are getting would probably come from any wash press,” Aspelin says. “But, we also get a lot of contact with specialists from ANDRITZ. I think we are using each other’s experience well. So far, it’s all been good. The press works, the Lo-Solids® works, and we’re looking forward to installing the DD Washers. Right now, we’re on a roll!”



▲ Fiberline operators in the control room at Stora Enso’s Skutskär Mill.

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“Saying a washer is a washer is much like saying an automobile is an automobile. They are similar in looks and function, but the differences in details can be quite substantial.”

Göran Bröttgårdh, ANDRITZ Product Manager

Lasse Aspelin (left), Fiberline Production Engineer at Stora Enso, with Göran Bröttgårdh in front of the AWP on Line #1. ▶



LO-SOLIDS® AT SKUTSKÄR

“We have been running our #2 Digester on the Lo-Solids® concept since August and it’s going really well,” says Lasse Aspelin, Fiberline Production Engineer. “We ran it in the 1990’s in the traditional Lo-Solids® counter-current mode, but stopped when we had the digesters shortened in a retrofit. This spring, we ran a two-week capacity test with Downflow Lo-Solids® and set a new production record during the trial. We made some

modifications during the summer and started up for a longer trial in August.

“It’s exciting to see how much we can push the production capacity upwards and the kappa variation is decreasing. I think that ANDRITZ has made it much easier now for the operators to work with it. We can now see that production is higher and the digester is more stable.”

Two of the three digesters at the mill. The digester on the left (Line #2) is now running trials with Downflow Lo-Solids® technology. ▶



Bruck pioneers log scanning and sorting

Operators at NSI's Bruck Mill in Austria used to perform manual and repetitive log sorting tasks which are now being done by automation systems from ANDRITZ. The result is improved productivity, safety, and pulp quality.



▲ NSI's Bruck mill increased its profitability by installing automatic log sorting and closed loop production control in the woodyard.



"Our net operating time has increased and surface cleanliness of the logs is excellent."

Helmut Schwarz, Line Manager for Pulp Production and Newsprint Production at Bruck Mill



"The project was justified on its ability to increase throughput, improve quality, and reduce costs."

Franz Medl, Assistant Raw Materials Supply

Norske Skog's Bruck an der Mur mill in Austria produces about 400,000 t/a of printing grades (newsprint on PM3 and LWC on PM4). High-grade pressurized groundwood (PGW) is an important component in the fiber mix, lending mechanical strength and surface properties to the LWC grades. The PGW plant processes about 200,000 m³ of spruce each year.

"Pulp cleanliness is absolutely critical for our grades," says Helmut Schwarz, Line Manager for Pulp Production and Newsprint Production at Bruck Mill. "We can't have any bark particles in the pulp, but excessive debarking is not economical. Add the seasonal fluctuations from frosted logs, and short ends or crooked logs which must be removed manually, and you find that the debarking process can be difficult to control."

Pioneering project

Bruck is making the most of its fiber resources with three innovative woodyard automation tools. On one level is BarkScan™

and LogScan™. On the optimizing level is DrumMatic™. "Bruck is truly pioneering with this degree of automation," says Rudolf Mayböck, Senior Engineer for ANDRITZ Automation.

During construction of PM 4 in 1989, the woodyard received a facelift when an ANDRITZ debarking drum and two manual sorting lines went into operation. In 1998, Bruck installed ANDRITZ BarkScan™ and DrumMatic™ systems. BarkScan™ is a vision system which gives real-time information on the wood content remaining in the bark waste. DrumMatic™ takes this and other inputs and controls the debarking drum's speed, filling level, and discharge gate position.

Thanks to this modernization, the mill has substantially reduced wood losses during debarking and maintains a more constant filling level in the debarking drum.

Rely on the eyes?

However, there was still the situation with

operator fatigue and errors. Bruck's operators visually sorted logs for the PGW operations. Running two shifts a day, the operation was staffed with three people – two of them responsible for manning the two sorting lines at any time. Manual sorting involved removing any logs whose external appearance (length, straightness, diameter, obvious defects) did not meet requirements. Given the speed and volume of the moving logs, this task required a high level of concentration, which could only be sustained for a limited period by a single individual. "There comes a point when your eyes begin to play tricks on you," Schwarz says. "Fatigue or lapses in concentration leads to errors which impact pulp quality."

"The solution was to automate this laborious and error-prone visual log sorting," Mayböck says. "Together we began a pilot project to utilize our experience in image processing systems and automated control." This was in October 2007. The project was justified on the ability to increase throughput of the debarking line, relieve the stress burden on operators, reduce costs, and improve sorting quality.

Tools for automatic log sorting

ANDRITZ Automation specialists installed a LogScan™ system for automating the log sorting process on both lines. LogScan™ is based on modern image processing. It consists of a special video camera and light



▲ Wood loss measurements provided by BarkScan™ provide the missing link for optimized debarking control. Here, Günter Flicker (left) and Rudolf Mayböck inspect the camera system utilized by BarkScan™.

From left to right: Helmut Schwarz, Line Manager for Pulp Production and Newsprint Production; Rudolf Mayböck from ANDRITZ; Günter Flicker, Electrical Maintenance Engineer; Franz Medl, Assistant Raw Materials Supply.





▲ LogScan™ uses a special video camera and light source mounted above the log conveyor.

source mounted above the log conveyor – as well as the computerized electronics for image processing, analysis, and communications to the DrumMatic™ supervisory control system.

According to Mayböck, “The logs are made to roll while in the scanning area so that the entire surface can be scanned,” he says. “Length and diameter are determined. Shape and cleanliness after debarking are also analyzed.”

LogScan™ automatically decides where to route the log: to the pressurized grinder, back to the debarking drum for more bark removal, or to a chipper which cuts unsuitable logs into chips.

Debarking optimized

Sorting with LogScan™ provides Bruck with logs that are within specifications for dimensions, shape, and cleanliness while avoiding operating disruptions in the plant, according to Schwarz. “Right after start-up we knew immediately that there was no need for vast improvements, but only for a little optimization,” he says.

Automatic sorting with LogScan™ has been operating at Bruck for over two years now. “This system has certainly lived up to

expectations in terms of optimizing the debarking process,” Schwarz says.

Schwarz notes that the surface cleanliness of our logs is now greater than 99.9% with minimum wood losses. Of particular importance is the constant and largely trouble-free throughput (16,000m³ per month). “Our net operating time for the double shift has increased from 13 to 15.5 hours,” he says. “This gives us flexibility to cancel an occasional shift or use it for preventive maintenance. We also now need one operator less at the log sorting station.”

Whenever there is a need to tweak or optimize the systems (for example, adapting to changes between fresh/mature logs or winter/summer logs), ANDRITZ Automation maintains an online link to the control systems. “It is helpful that ANDRITZ has remote access to our plant so that they can assist with these small adjustments and optimization,” Schwarz says.

Much like BarkScan™, LogScan™ also communicates with the DrumMatic™ control system to optimize the entire debarking process. “Bruck is unique in having these control systems integrated into one network,” Mayböck says.



Bruck's shift supervisor gets information from the DrumMatic™ optimization system. ▼

FIND OUT MORE AT
www.spectrum.andritz.com

“Bruck is truly pioneering with this degree of automation.”

Rudolf Mayböck, Senior Engineer for ANDRITZ Automation



ANDRITZ PUMPS KEEP PULP IN MOTION

ANDRITZ has a long history of supplying process pumps for the Pulp & Paper industry. The new designs deliver state-of-the-art performance for a variety of applications.

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- Heads up to 140 m
- Consistencies up to 6% at 60°C

Medium Consistency Pumps

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- Without vacuum pump
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- Heads up to 190 m
- Consistencies up to 16% at 60°C
- Temperatures up to 140°C
- Efficiencies up to 70%

Fan Pumps

- Double suction split case pump
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- Impeller with staggered blades
- Flow rates up to 20,000 m³/h
- Heads up to 110 m
- Consistencies up to 2% at 60°C
- Efficiencies above 90%
- Low pulsation

For more information please see www.andritz.com/pumps

Half the energy, increased strength

The installation of a new LC refiner at the Braviken mill is part of a very public project to demonstrate dramatic reductions in energy consumption for mechanical pulp production. The refiner, the largest of its kind, is the result of a cooperative development between Holmen and ANDRITZ. What is achieved at Braviken could benefit TMP producers around the world.

"We have a goal in this development project of 750 kWh/t," says Christer Sandberg, Development Project Manager for Holmen Paper. "Our old TMP line consumed roughly 2,250 kWh/t."

It should be possible, says Göran Korsfeldt, Production Manager at Holmen's Braviken mill in Sweden. Braviken is the site of a new TMP production line that is unique in the world. "Separating fibers in the refining process consumes roughly only one-third of the total energy. The rest is just producing heat. If we can reach something like 800-1,000 kWh/t, then we will significantly lower our cost of producing pulp."

The concept for the new line at Braviken is a combination of three process steps: RT-pretreatment, high consistency (HC) mainline refining, and low consistency (LC) secondary refining. Not only is the process unique, but the huge ANDRITZ TwinFlo LC refiner (72-inch) is a totally new machine and the largest in the world.

Laying the groundwork

The groundwork for the development project started 10 years ago, according to Sandberg, when Holmen experimented with HC mainline refining and LC secondary and reject refining in the same line. "We began by using a mobile rig from the Swedish research institute here many years ago," says Sandberg.

The results were so good that Braviken installed its first ANDRITZ TwinFlo refiner for LC in 2003. "The big advantage to LC is the low energy consumption," Sandberg says. "It has about half the energy consumption for a given increase in strength properties compared to HC single-disc refining. Another advantage is that when we put the TwinFlo in the mainline before the screening

room, our problems with screen plugging stopped."

"The whole industry can benefit"

The TMP development project received a grant of SEK 40 million (EUR 3.8 million) from the Swedish Energy Agency. According to Thomas Korsfeldt, Director General of the Agency at the time of the grant, "If this project gives successful results, the technology could be employed at other TMP mills in Sweden and produce annual electricity savings of around 1.5 TWh, which is between 1-1.5% of Sweden's total electricity use."

Because of the grant from the Swedish Energy Agency, most of the results Braviken obtains from the project will be public. "That is fine with us," says Rikard Wallin, Mill Manager. "We built bypasses in this line that gives a highly scientific level to our work that you would not normally find in a running mill. I am really proud that the Holmen board of directors had the vision and courage to invest the money to do these extra things."

Three industrial postgraduate students are also working on the project, each with a focus on a key part of the process: pretreatment, HC refining, and LC refining. "It is quite unique to have three industrial researchers of this caliber working on the same TMP line," Sandberg says.

The new line

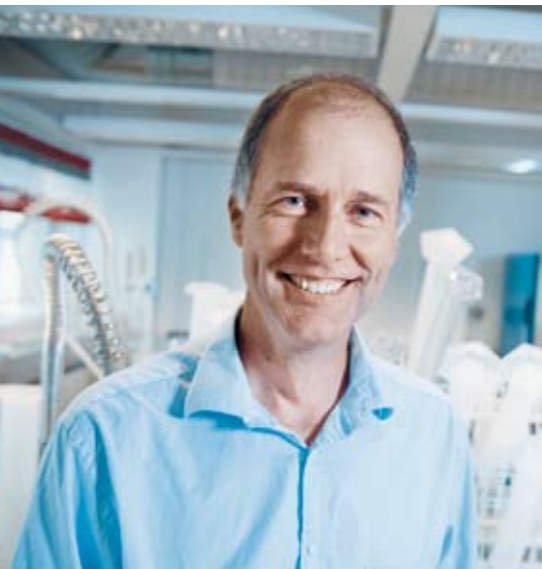
Braviken was one of the first mills to go completely with TMP technology when it was built in 1977. Formerly, there were three lines producing 1,300 t/d for three paper machines producing newsprint and directory paper. Now there are two with only a slight increase in production capacity. Capacity of the new line is 800 t/d. The mainline started in August 2008 and the LC refiner was brought online earlier this year.



"My view is that we must find a way to drastically cut energy consumption – at least by half – to be profitable in the future."

Rikard Wallin, Mill Manager at Braviken

The world's largest LC refiner:
The TwinFlo 72



"We have a goal in this development project of 750 kWh/t."

Christer Sandberg, Holmen's Development Project Manager

"If you look at our installations, the main driving forces have been production increases and energy savings," says Korsfeldt. "This development project with ANDRITZ is very much focused on quality and energy, not so much for a production increase."

Matching size with a new design

Holmen began discussions with ANDRITZ to inquire about a new LC refiner design. "The general trend for HC refiners is that they have become bigger and bigger," Sandberg says. "Why not match the LC refiner size with the HC refiner and reduce the overall cost of the installation?"

ANDRITZ has been active in developing LC refining technology and gladly accepted the challenge to work with Holmen on producing a large LC refiner. "Energy will not be cheaper," says Thomas Paar, ANDRITZ's Project Manager, "so what is necessary is to drive energy consumption down. We were very positive and very excited to work with Holmen on this project."

Producing the world's largest LC refiner was not as simple as just scaling up a smaller design. "Each requirement such as gap measurement, rotor stability, sufficient mass, and precision hydraulic control had to be taken into account," Paar says.

Adaptations to the massive (46 tonne) refiner are ongoing as the unit gains operating time. "ANDRITZ has listened to our comments and our input," Sandberg says. "There is work to optimize the refiner plate design and to ensure rotor gap stability. Since this is the first LC refiner with gap measurement, we have a PhD student helping learn how to effectively utilize this measurement."

"It's possible that the TF 72 will produce even greater benefits on the rejects line than the mainline," says Lennart Nilsson, Production Manager for TMP and Wood handling. "The refiner is very good, very stable, but I think it needs higher throughput. You can put much more load on reject fibers in LC than is possible on mainline fibers."



▲ Part of the RT-pretreatment technology at Holmen Paper Braviken mill.

"If this project gives successful results, the technology could be employed at other TMP mills in Sweden and produce annual electricity savings of around 1.5 TWh, which is between 1-1.5% of Sweden's total electricity use."

Göran Korsfeldt, Braviken Production Manager

Göran Korsfeldt (left) with Thomas Paar, ANDRITZ's Project Manager



"We have the flexibility to try these different ideas," Sandberg says. "We will also look very carefully at chemical pretreatments. We are not in a hurry and will do this step-by-step."

Pretreatment options

According to Nilsson, one step that holds promise is the ANDRITZ RT-pretreatment process although it has never been operated on mill scale before with Nordic Spruce. "We have to investigate what benefits we can achieve with it," he says.

According to Paar, the main benefit of pretreatment is an increase in long fiber content and tear strength. ANDRITZ delivered the entire pretreatment system including variable speed conveyors, presteaming bin, rotary valve, Impressafiner MSD, impregnator, and a buffer bin.

The goals of pretreatment are to soften the cell walls of the wood chips to ensure a gentle opening of the fibers and to elimi-

nate potential damage to the fibers before processing the chips in the Impressafiner MSD. The Impressafiner MSD macerates the chips (to expose more surface area for chemical impregnation) and squeezes out pitch and other extractives.

"We will make a lot of trials with different chemicals," Nilsson says. "ANDRITZ is modifying the screw in the Impressafiner MSD to increase the compression rate, which should improve pitch reduction and also energy savings."

Impressive results already

"I have been involved in seven big TMP installation projects in my career," Nilsson says. "This was the best one as it was so easy to start. Within two hours from start-up the paper machine operators could see the difference in pulp quality. So, it was a success from the very beginning."

"We knew that we would get a big boost in energy recovery, but we also had some pleasant surprises with the new line," Wallin says. "The light scattering of the pulp is so high that we have been able to reduce the use of special pigments. We have been able to reduce retention aid chemicals on the paper machine. And, we have reduced the use of kraft pulp to almost nothing in the mill."

Cut it in half?

"My view is that we must find a way to drastically cut energy consumption – at least by half – to be profitable in the future," Wallin says. "I don't know how we're going to do it, but we have to do it. We have to set aggressive goals – not 2% here and 3% there."

Wallin finds it positive that ANDRITZ wants to be part of the solution. "We really want to work with them to make mechanical pulping competitive in an energy sense," he says. "In this economy, it's not a walk in the park for anyone, so we really appreciate the commitment and support."

Platform for the future

"This investment gives us freedom to develop this mill," says Wallin. "We have a

plant that can support conversion into any mechanical printing grade: news, improved news, SC paper, or coated mechanical if we want to go that way."

Wallin thinks that from a practical point of view, "the front line of mechanical pulping research is in Braviken for the next two or three years. If the technologies here can be applied in other places, we can contribute to lowering energy consumption and emissions globally."

Wallin's team of managers and operators find this development work fun and exciting. "We all have children and grandchildren," he says. "We think it's a noble goal to produce desirable products at a profit, without harming anyone or harming the environment. If we can't do that, we are not very good engineers or business people."

FIND OUT MORE AT
www.spectrum.andritz.com



▲ Lennart Nilsson, Production Manager for TMP and Wood handling

Raising the curtain on *Prime* performance

A new curtain coater from ANDRITZ helps an innovative paper producer produce top quality and develop technical papers for the future.



"Because only the non-contact contour coating process can achieve an almost perfectly homogenous surface."

Peter Müller, Plant Manager and member of the Cham Paper Group's Management

Chief Chemist Natacha Valera and her colleagues setting the parameters for the "slurry" (coating mass).



"Paper is used in more technical applications than most people are aware of," says Dr. Peter Müller, Plant Manager and a member of the management board for Cham Paper Group (CPG) of Switzerland.

CPG concentrates on specific value-added technical applications, lending credence to their motto "Innovation out of tradition!" The tradition comes from Cham's 350-year history. The innovation comes in such areas as digital printing. CPG's expertise is so comprehensive that employees function as consultants in the development of special printing software.

"We have always been looking for competence areas that show medium- to long-term development potential," says Müller. "Years ago, we targeted digital printing – developing papers which would showcase the strong points of that printing technology. As part of this, we also investigated curtain coating as a tool, because only the non-contact contour coating process can achieve an almost perfectly homogenous surface."

Labels and flexible packaging

Digital printing, however, is not the only focus at Cham. CPG believes the areas of labels and flexible packaging are just as important. Here, the intent is to replace plastics in certain applications. "We are able to offer paper for flexible packages which are comparable in their properties to plastics," Müller explains, "but are manufactured from renewable, sustainable resources. With this added benefit, they are better alternatives."

The more diverse the packaging material, the higher the separation costs in waste disposal. "Companies and communities can save money by limiting themselves to one type of material," Müller says. "This is why we are developing new papers which have the properties of plastic foil, but use wood fiber."

In this development area, explains Müller, curtain coating is also an important precondition for further development – especially for coatings which ensure special chemical or mechanical properties. The efficiency and economics are improved by the ability to apply several coating layers at the same time.

Raising the curtain on technology

Curtain coating achieves excellent coating profiles in cross-web and machine direction – and can apply multiple layers simultaneously in one pass. While it may be rather unknown in the paper industry, it has been well-proven for coating single and multiple layer products in the photographic industry since the 1970's.

The coating liquid in curtain coaters is pre-metered with minimum deviations in profiles ($<\pm 0.5\%$ in MD, $<\pm 1\%$ in CD), and no excess application of coating liquids. The process creates an even coating on uneven substrates (contour coating) and defects, which can be observed in blade coaters or slot die coaters, are virtually absent.

For multilayer curtain coating, different coating liquids are applied through individual metering slots in special dies. It is also possible to split one very thick layer to two or more slots and to combine layers with different thicknesses.

PrimeCoat Curtain project

In 2009, Cham Paper Group made an investment in a new curtain coater (PrimeCoat Curtain) from ANDRITZ PULP & PAPER. In addition to the coating machine, ANDRITZ retrofitted two air float dryers and delivered a new air float dryer with heat recovery.

The new PrimeCoat Curtain design is highly flexible, according to Walter Keller, CPG's Head of Engineering, which was a key consideration in it being selected. The new coater is more than a production unit; it is



"The PrimeCoat Curtain design is highly flexible."

Walter Keller, Head of Engineering for Cham, was responsible for the modernization and start-up of Coating Machine 5

▲ The Cham Paper Group manufactures speciality paper grades for applications in the areas of printing, packaging, and labels.



▲ Above: The PrimeCoat Curtain is capable of over-board (no edges as shown above) or in-board (with edges) coating. Below: Since May 2009, the PrimeCoat Curtain has been utilized for production and product development in the Coating Machine 5 line. ▼



also used to systematically develop new paper products. "We run trials for product and process development every chance we get," Keller says. "This is an ideal way to bring innovative products to the market."

The PrimeCoat Curtain can be easily configured to produce in-board or over-board (with or without edges) coating. The curtain height and angle of inclination can be adjusted individually. A multi-layer die has been integrated into CPG's coater. Another feature is the web guiding system included in the delivery, which guides the web smoothly and straight through clearly defined edges down the machine. The guide, spreader, and tension measuring rolls are all driven to exclude tensile strain. In addition, a web break monitor shuts down the drives immediately in case of a web break. The vacuum roll, also part of the ANDRITZ delivery, provides a fixed point for tension control.

The die is critical

The core of the PrimeCoat Curtain is the die. CPG opted for a cascade die capable of applying different media in a two-layered curtain simultaneously. The coater at CPG is infinitely adjustable for widths between 3,020 and 3,280 mm. The curtain can be set up at different heights (200 to 350 mm) and its angle of impact can be inclined by up to 10 degrees. Base papers from 60-200 g/m² are processed at speeds between 200-750 m/min.

In March 2009, Coating Machine 5 restarted operation, initially with the three-blade coating apparatus. Since May of 2009, the PrimeCoat Curtain has been running in regular production. The greatest challenge has been in arriving at the perfect coating mass. Temperatures and other chemical aspects are as important as setting up the machine parameters, Keller says. Like other processes in paper finishing, coating is a

complex interaction of many different factors, which lead to a highly modern and effective way of producing innovative special papers.

"We are the experts in developing and producing papers with special functionalities," Müller explains. "Sure, we produce the base papers which contribute significantly to the end product, but at the end of the day it is the coating which makes the difference."

Coating is one of CPG's essential competences. It has ensured them success in special profitable niches. "And this," Müller stresses, "will be strengthened markedly with the new curtain coater from ANDRITZ."



Side by side

Increased pulp production and increased energy production – two main outcomes for ENCE's EUR 250 million revitalization of its Navia mill. A visual symbol for this dual goal is the new ANDRITZ BioBoiler and new recovery boiler that sit side-by-side in the same building. Alongside is a newly rebuilt drying line and an evaporation plant – also from ANDRITZ.

The Navia mill, on the Costa Verde of Spain, was once known as CEASA (Celulosas de Asturias S.A.), and is now owned by the ENCE Group. It has been the focus of major activity – and major investment in the last months.

When completed, ENCE claims that Navia will be the most efficient pulp mill in Europe, with a production capacity increase from 300,000 to 500,000 t/a and 550,000 MWh/a of electrical energy generated from renewable sources. That represents 76 MW of biomass renewable energy.

Papermakers and energymakers

"Not only are the side-by-side boilers efficient from a construction standpoint," says Eduardo Garcia, Mill Director for ENCE Navia, "but they improve our ROI by generating green energy for sale to the grid. This is a new business area for us."

The project design started about five years ago. "Originally, we were very conservative,"

Florentino Lopez, ENCE's Project Manager for the recovery island (left) with Roberto Lemos, ANDRITZ Site Supervisor for the BioBoiler and recovery boiler. ▼

Garcia says. "But then we had a change in the company development strategy. By combining our expertise in green electricity generation with traditional papermaking, our target for energy production increased significantly."

First BioBoiler

The batch cooking process was replaced by continuous. And, ENCE decided to increase the pressure of the mill's steam, which meant replacing the boilers and turbines completely.

"The negotiation for the boilers was tough since it was the first major package to be contracted," Garcia says. "ANDRITZ had good references for their recovery boilers, but did not yet have a reference for their biomass boiler. On our side, we are quite experienced with the technology. We have been fighting with euca bark for several years, which is a difficult fuel. We evaluated the ANDRITZ technology and were confident that it would be successful."



"We are really happy with the biomass boiler."

Eduardo Garcia, Mill Director for ENCE Navia

The ANDRITZ BioBoiler is based upon bubbling fluidized bed (BFB) technology, which is the preferred technology for burning biomass. It has a membrane-walled, single drum structure.

The key component is the furnace floor, for which ANDRITZ developed an advanced construction to enable the use of the most challenging fuels.

Florentino Lopez was ENCE's Project Manager for the Recovery Island upgrade. "We had a very tight schedule," he says. "The contract was signed in January 2007 and the BioBoiler started up in November 2008." There was no problem with the boiler, but the mill had to wait for the delivery of the turbines before the BioBoiler boiler could be started on time.

Lopez notes that the ANDRITZ boiler operates at 120 bars pressure and the steam flow is 120 t/h. "Not the biggest, but this is a large boiler," he says.





"The crane lifts were exciting."

Jeff Brown, ANDRITZ's Project Manager for Evaporation

The boiler has been operating well since November 2008. "Its performance depends upon the quality of the biomass, which is difficult to control," Lopez says. "About 40% of the fuel is bark from the mill and the other 60% is procured on the outside. It was difficult to check the quality, and we had some issues with large stones, oversize bark, etc."

Lopez estimates that at full capacity, the BioBoiler will burn about 400,000 t/a of biomass. "About half the energy we produce at the mill is consumed here, and the other half is available to the national grid," he says. "This is a significant revenue opportunity for us."

Fully recovered

ANDRITZ was also selected to supply the chemical recovery boiler, the evaporation plant, and the ash recrystallization system (ARC) for removing corrosive chlorine and potassium from the boiler ash.

The recovery boiler is rated at 1,800 tds/d and has the flexibility to handle the full production increase in the mill. It operates at 93 bar pressure and a temperature of 485° C. Incoming black liquor is 75% dry solids (without ash). "Putting the two boilers in the same structure was the best solution from the technical and economical point of view," Lopez says. "We have a common

feedwater system, common continuous blowdown, common condensate tank, etc."

A major mill shutdown began on January 19, 2009. When the mill came back up on March 1, 2009 the recovery island was complete and running, according to Lopez.

But it wasn't that simple.

The big lift

The evaporation project was challenging because ENCE wanted to reuse some of the existing equipment. As is often the case, the existing equipment was not in the right location, according to Jeff Brown, ANDRITZ's Project Manager for the evaporation plant.

"All of the new equipment was installed and commissioned at the end of 2008," Brown says. Then, Brown and his team had to wait until the January shutdown to relocate the existing equipment and put everything together.

Relocation required a 750 t crane. "Only one

vendor in Spain had a rental crane capable of making the lifts," Brown says. "The crane lifts were exciting." The major lifts took just two days – two evaporator bodies, a stripping column, and a large surface condenser. "It went like clockwork," Brown exclaims. "It couldn't have gone any better."

"Because of the tight schedule, we needed site people who could be firm and get things done," Lopez says. "The ANDRITZ team had these people, yet they were open and professional the entire time."

"The project team for evaporators and boilers at ANDRITZ has done excellent work," says Cesar Morante, Project Director for ENCE Navia. "They knew what was required and worked independently to get the job done. They are very professional and efficient."

World-class install – world-class drying

Unlike other areas where equipment could be pre-erected prior to the January 2009 shutdown, the drying line did not have that luxury. "That is one of the major reasons

A view of the rebuilt evaporation plant at Navia, including the ARC system for removing corrosive chlorine and potassium from the recovery loop. ▼



▲ ANDRITZ commissioning and start-up team for the drying line (from left to right): Antonio Ricardo, Start-up Manager, Markus Glettler, Instrumentation Engineer, Johannes Jammerneegg, Start-up Manager, Paul Wratschko, Process and Technology Engineer, Markus Kofler, Start-up Engineer



▲ ANDRITZ rebuilt the dewatering machine on the drying line.

that we chose ANDRITZ," Morante says. "Eighty to ninety percent of the work had to be done during the shutdown period, requiring a well-planned approach. We had good experience with ANDRITZ's on-site erection services in the past."

According to Morante, the existing drying line was essentially an ANDRITZ design from when ANDRITZ did a modernization at Navia in 2002. "We have been very satisfied with the performance of the line," Morante says. "The machine is quite reliable and the production guarantees were fulfilled."

The new line will be capable of world record guaranteed specific production (guaranteed tonnes produced per each meter width of the machine). Design capacity is 1,600 t/d (400 tonnes per working meter guaranteed specific production). The highest guaranteed specific production so far is 375 t/m at Aracruz Celulose in Brazil. Since the rebuild, Navia has achieved 1,594 admtd/d production and further work is being done to optimize the process.

"Our relationship with ANDRITZ has been quite good throughout the drying line project," Morante says. "They fulfilled the requirements during the shutdown without delay. That was quite important. Their erection experience and the coordination of new equipment into the existing equipment has been superior."

Commissioning on the run

One major challenge for ENCE was that

due to the short shutdown period, there was very little time to fully test the systems after modifications were made. "The starting of the new equipment was more or less on schedule," Garcia says. "The retrofits, however, were quite complex, and we had limited time to fine-tune. Basically, we had to commission equipment while we were running it."

"Still, there are no issues with the overall design, and the mill is balanced. There are only small problems and fine-tuning to be done. Our goal to produce consistently and at steady-state – and we are quite confident."

FIND OUT MORE AT
www.spectrum.andritz.com

"Our relationship with ANDRITZ has been quite good throughout the project."

Cesar Morante, ENCE Project Director, on the drying line



Highlights of

NEW ORDERS

COMPLETE LINES
Shouguang Meilun Paper (Member of the Chenming Group) Shouguang, Shandong, China PrimeLine tissue machine including air system: 5.6 m working width and a max. design speed of 2,000 m/min; Yankee dryer; a two-layer headbox; PrimePress XT shoe press and an advanced linear reel; stock preparation and PMA system
Zhanjiang Chenming Pulp & Paper Zhanjiang, Guangdong, China Process technologies for a 700,000 t/y bleached hardwood kraft greenfield mill: wood handling system; fiberline incl. cooking, washing, oxygen delignification, screening and bleaching; evaporation system; recovery boiler; recausticizing plant and lime kiln; and a market pulp drying and bale finishing plant
Complete stock preparation and PMA system for a fine paper machine
Shandong Huatai Paper Group Dongying, Shandong, China Stock preparation and PMA system for 1,210 t/d capacity

COMPLETE LINES
Muda Paper Mill Kajang, Selangor, Malaysia OCC line for 600 t/d capacity
Changle Xinmai Paper Industry Weifang, Shandong, China PMA system for 1,700 t/d capacity; ANDRITZ disc filters for deinking and OCC
Foshan Huafeng Paper Zhuhai, Guangdong, China Stock preparation system for 760 t/d capacity
Pelita Cengkareng Paper Tangerang, Jawa Barat, Indonesia OCC line for 1,150 t/d capacity
Packaging Corporation of America (PCA) Valdosta, Georgia, USA High Energy Recovery Boiler (HERB) including chloride and potassium removal system; 589 tds/d capacity
Zhumadianshi Baiyun Paper Shouguang Meilun Paper Zhumadian, Henan, China Stock preparation and PMA system for 450 t/d capacity; ANDRITZ disc filter

KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS
Guangshui Zhongshan Hengxing Paper Guangshui, Hebei, China Key components for OCC system
Thai Union Kanchanaburi, Thailand FibreFlow® drum pulper to replace conventional pulper
APP Indonesia 3 PrimeDry Steel Yankees with 12 ft. diameter at mill locations in Jambi, Hainan, and Perawang
VPK Packaging Group Oudegem Papier Oudegem, Belgium Rebuild and modernization of PM 6
Obeikan Paper Industries Riyadh, Saudi Arabia Key components for deinking and OCC systems
Cartiera Ciacci Gualdicciolo (San Marino), Italy PrimePress X shoe press
National Printing Bureau Okayama City, Japan LC refining system with TwinFlo refiners
Nanning Sugar Industry Pumiao, Guangxi, China Bleaching equipment for bagasse pulp with a capacity of 422 adt/d

Highlights of

NEW START-UPS

COMPLETE LINES
Visy Pulp and Paper Tumut, NSW, Australia Cooking and washing modernization; white liquor plant; recovery boiler; evaporation plant capacity increase
Complete OCC line, stock preparation and refining system for 540 t/d capacity
Stora Enso Skutskär, Sweden ANDRITZ wash press AWP First start-up of new AWP wash press
Veracel Celulose Eunápolis, Bahia, Brazil Eucalyptus chipping line with HHQ-Chipper; highest capacity single line in the world (500 m³ sob/h)
Yueyang Paper Yueyang, Hunan, China Deinking line for 400 t/d capacity
Fibra Tres Lagoas, Mato Grosso do Sul, Brazil World's largest single-line fiberline; including a pulp drying system, and LimeKiln™

COMPLETE LINES
Sun Paper Group Yanzhou, Shandong, China Start-ups of two MVR Zedivap® effluent evaporators for an APMP line

KEY EQUIPMENT, UPGRADES, AND MODERNIZATIONS
Fujian Quingshan Paper Quingzhou Shaxian County, Fujian, China PrimeCal Hard calender
MES-TECH Company Kuala Lumpur, Malaysia PrimeCoat Combi coater
Holmen Paper Braviken Braviken, Sweden TF-72 LC refiner – world's largest LC refiner
SCA Hygiene Products Mannheim, Germany Evaporation plant capacity increase
Weyerhaeuser Columbus, Mississippi, USA Recovery boiler retrofit

PANELBOARD
Duratex Agudos, Brazil Complete fiber preparation system for MDF incl. a woodyard; a chip washing system and a 1,584 t/d pressurized refining system for MDF; world's largest single-stage pressurized refining system for MDF; 3 rd order from Duratex
Anhui Huqian Investment & Industry Fu' Nan, Anhui, China Complete fiber preparation system for MDF incl. a woodyard; a chip washing system; and a 672 t/d pressurized refining system
Jiangxi Green Nature Panel Board Shangrao, Jiangxi, China 360 t/d pressurized refining system for MDF
ShaanXi Zhong Xing Timber Xian, Shaanxi, China 600 t/d pressurized refining system for MDF
OMO Wood Lagos, Nigeria First ANDRITZ pressurized refining system for MDF in Nigeria (192 t/d)

SIGNING CEREMONY FOR GREENFIELD MILL IN CHINA

Shandong Chenming Paper Holdings Limited, one of the largest pulp and paper producers in China, selected ANDRITZ to supply all the process technologies for a 700,000 t/a greenfield bleached hardwood kraft mill in Guangdong Province. In addition, ANDRITZ will supply a complete stock preparation and approach flow system for a fine paper machine at the same mill. Start-up is scheduled for mid-2011.

In a follow-up order, ANDRITZ was selected to deliver a 5.6 m wide PrimeLine tissue machine to Shouguang Meilun Paper Co., Ltd., part of the Chenming Group. Included in the delivery is the stock preparation and approach flow system, as well as the PrimeControl automation system.

In the photo, Karl Hornhofer, Head of Capital Systems and Member of the Executive Board of ANDRITZ (seated at left) signs the contract documents for the greenfield pulp mill with Yin Tongyuan, Vice Board Chairman and General Manager of Chenming.



STRENGTHENING SERVICE IN CHILE

As soon as Service Manager Dale Love hung up the occupancy permit for the new Service Center in Concepción, he focused his employees' attention on their first service jobs: rebuilding a bark disc screen for one customer and refurbishing wear segments for another.

Workshop production is ramping up quickly since the Center opened in July. The service team recently signed their first HQ+ service contract in South America (regular maintenance of chipper knives in the wood processing line), which will be a nice base for future business in Chile.

In the photo, the service team for ANDRITZ in Chile poses in front of the new Service Center.



ROLLTECK WINDERS NOW PART OF ANDRITZ

ANDRITZ acquired the majority of assets of Rollteck GmbH of Germany. Rollteck has been a specialist in planning and developing winders for paper production for more than 30 years. ANDRITZ Rollteck winders cover a wide range of paper grades. Their Arcus winder currently holds the world speed record at 3,300 m/min.

ANDRITZ Rollteck winders complement the expanding portfolio of paper technology products which includes machines, coaters, calenders, presses, and other equipment.



A tricky problem benefits from an **elegantly simple** solution



Getting the ink out is the problem. Removing ink and stickies – without degrading the good fiber – is the solution. The SelectaFlot deinking unit from ANDRITZ PULP & PAPER pro-

vides the simple but efficient solution. Each piece of equipment is designed with the target of being reliable and improving the pulp and paper quality... thus increasing your mill's efficiency.