


# FiberSpectrum

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The Magazine of Andritz Pulp&Paper



*"This money pipe was a present to us from the bank during our groundbreaking. It's a reminder to keep on schedule so we could turn the valve and start the flow of money."*

*Rija Ratnik,  
CFO of Estonian Cell*

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A message from Andritz Pulp & Paper Management

## "Bernhard Rebernik – a visionary man helping ideas take shape"

*On April 1, 2007, Bernhard Rebernik, who had been Member of the Managing Board of Andritz since 1991, retired on reaching age 65. When he took over responsibility for Andritz's Pulp & Paper business*

*25 years ago, the position of Andritz being a well-recognized global supplier of complete systems was only a vision.*

*When Bernhard became head of Pulp & Paper Technology, Andritz had very few products it could call its own. The majority were licensed, or purchased and resold. Our vision was to expand globally by providing the best technology, complete production lines, and comprehensive services at a fair price. Products had to be developed and capabilities acquired to put all the pieces in place.*

*So Bernhard took our few "star" products (twin wire press, etc.) into the global market. Through acquisitions, we added well-known names such as Sprout-Bauer, Kone Wood, Durametal, Hymac, Ahlstrom Machinery, ABB Fläkt Industries, Fiedler, and Küsters. Step-by-step we were able to reach our vision of being a supplier "from wood to paper."*

*The acquisition of Ahlstrom Machinery in 2000/2001 was an important step that added chemical pulping, and recycled fiber capabilities. From then on, Bernhard and Markku Hänninen expanded upon Andritz's position as a reliable supplier of complete production systems for all types of pulp and certain grades of paper.*

*Several key orders confirmed our strategy was correct. The ones that come to mind are Aracruz Fiberline C, Veracel, CMPC, Botnia in Uruguay, Estonian Cell, Marusumi in Japan, TAD tissue machines in the USA, seven modern tissue machines in China, new deinking technology, and the most energy-efficient mechanical pulping systems in the world. These orders showed that customers accepted our approach on a world-class level.*

*Today, Andritz can bring considerable resources from under one roof to each customer's unique situation. This means it can be a "partner" instead of just a*

*"vendor." We know that every project in every mill has its unique challenges. It is our job to understand what is important to different customers in different regions.*

*This successful development of Andritz's pulp and paper activities was to a great extent the result of Bernhard Rebernik's steady efforts and ability to build a good team. I would like to take this opportunity to express my appreciation to him and for his achievements for Andritz.*

Wolfgang Leitner  
(President & CEO)

**"My first love was – and still is – the excitement of learning."**

With retiring comes a sense of accomplishment for all that our team has achieved together, and a sense of gratitude for having met so many brilliant, committed, and fascinating people in the global Pulp & Paper community.

I am grateful that through our many customers/partners we have been able to develop technologies that achieve the highest capacities, fastest machine speeds, lowest energy consumption, lowest chemical consumption, and most advanced automation in the industry. Many of you took the risks and the extra effort with us – helping us push the envelope for the entire industry.

The work years have passed quickly. It has been a pleasure to be part of this challenging industry. Thank you for so many years of good cooperation and excellent personal relationships.

I have now retired from day-to-day management. Now I will

have more time to spend with family, use my season opera tickets, brush up my Italian, and go on ski mountain tours. But, I do not plan on disappearing from Andritz completely. I have agreed to serve as a consultant to Andritz, working on certain projects and staying in touch with certain customers and partners.

It gives me particular pleasure to see my younger colleagues develop and thrive. I congratulate Karl Hornhofer (Capital Equipment) and Humbert Köfler (Service) on their appointments as new board members responsible for the Pulp and Paper Business Area. Both were members of my team, and I hold them in very high esteem. Please extend the good cooperation and trust to our younger management team.

With many thanks and kind regards,

Bernhard Rebernik  
(Member of the Managing Board, retired)



# Winning the world's respect

Though heavily forested, Estonia is not known as a producer of pulp and paper. The people at AS Estonian Cell wish to change all that. Their new BCTMP mill is a highlight of industrial development in Estonia. It is among the most modern in the world – showcasing several new innovations from Andritz – and holds itself to very high environmental standards.

Remember the first time you ever set foot inside a mill? Whether you were a youngster, or a young university graduate, or an adult – you were no doubt fascinated by the sights. Perhaps you were intimidated by the massive moving machinery, and in awe of the hard-working people who operated the complex equipment. There was so much to learn, and so much to master!

Walking through this greenfield bleached chemi-thermo mechanical pulp (BCTMP) mill in Kunda, Estonia brings those same feelings to the surface again – the newness and the excitement are reflected in the eyes of the workers. Enthusiasm awaits at every

turn – an infectious gift from your host and tour leader, Lauri Raid, Production Manager of AS Estonian Cell.

There is no doubt that Raid loves what he does. “When I was studying pulp and paper at the university, I dreamt of a time when there might be a greenfield mill in Estonia,” Raid says. “I didn’t really think it would really happen, though. You can imagine how happy I was when this project was announced!”

The “project” that Raid is referring to is the Estonian Cell mill designed to produce 140,000 t/a of hardwood market pulp. AS Estonian Cell is located in

northeast Estonia, just a short distance from the Baltic Sea.

## Major investment

The € 153 million investment by Austria’s Heinzl Holding, Norway’s Larvik Cell, and the European Bank for Reconstruction and Development is the second-largest direct foreign investment in Estonia.

The owners selected RWE Industrie-Lösungen of Germany, now a division of MAN Ferrostaal, as the turnkey contractor in April 2004.

Estonian Cell is a showcase for Andritz’s P-RC™ APMP technology. The process produces pulp with high quality mechanical and optical characteristics while reducing energy consumption. Lauri Raid, Production Manager at Estonian Cell, in front of the mainline refiners (Andritz S2070 series) at the mill. ▼



◀ The Andritz RotaBarker™ in the woodyard is a new innovation. It is especially suited for debarking frozen logs in a dry process without costly de-icing. No water is used in the process. Wood losses are minimal.



▲ About 50% of Estonia is forested. Estonian Cell utilizes 100% aspen fiber to produce its high-quality bleached chem-thermo mechanical pulp.



▲ Joe Masella, Project Director for KSH Solutions (left), and Peter Masloch, Deputy Project Director for RWE Industrie-Lösungen (now part of MAN Ferrostaal).

“The idea was to have a turnkey contractor with full responsibility, one major supplier for technology, and somebody else to handle the balance of the plant (water, effluent, power, etc.),” says Heinz Günther Grollman, a Vice President with RWE.

According to Grollman, Andritz was involved very early in the technical discussions and contributed significantly to the process design and technologies employed. It was natural then that Andritz would become the technology supplier. YIT of Finland was selected to deliver the raw water and effluent treatment facilities. KSH, a subsidiary of RWE, was responsible for basic and detail engineering, as well as delivering the balance of the plant.

Johannes Galos was the Andritz Project Director. Galos coordinated the overall project and was the primary liaison with the customer (RWE) and client (Estonian Cell). Johann Unger was

the General Site Manager, with overall responsibility for the site activities. The Andritz team, including wood processing experts from Finland, drying experts from Austria and Sweden, and mechanical pulping experts from Austria, came to Kunda in May 2005. “It was like running a small company,” Unger says. “We had to build our infrastructure, hire sub-suppliers, handle the accounting, and personnel.”

Unger certainly has the credentials for the job – having been with Andritz for 40 years and having supervised projects literally around the world. “Even after all these years, it is very exciting for me personally to help new regions and countries develop. This is an important achievement for Estonia.”

## Aspen as wood source

Estonia is a richly forested nation. Over 50% of its territory is covered with forest.

Aspen (*populus tremula*) accounts for 7.3% of the nation’s wood volume. Roar Paulsrud, one of the owners of Estonian Cell, developed the idea of establishing an aspen pulp mill in 1999 as he bought aspen from Estonia through his Norwegian company, Larvik Cell. One of Larvik’s subsidiaries is responsible for wood purchasing. Long-term purchase agreements are in place with the state-owned RMK and with Nor-Est Wood, a private company. Both suppliers have FSC certification. Estonian Cell’s annual demand at full capacity is 380,000 m<sup>3</sup> of aspen pulpwood. The Andritz technology gives the mill flexibility in handling lower quality wood.

## A showcase for technology

As Project Director, Andritz’s Galos has a unique overview perspective of Andritz’s technology. “It is really a source of pride for me to see how our technol-



▲ Riia Ratnik, Chief Financial Officer for Estonian Cell. "Nature and the forests are so much a part of Estonia's history."

## AS Estonian Cell

ogy can help a mill meet its challenges in so many ways," Galos says.

For example, the challenge for Estonian Cell is to get the maximum good quality fiber from the supply of aspen logs, says Heikki Valtokari, Andritz's Project Manager for the woodyard delivery. This involves not only yield (minimum wood losses), but the ability to screen out off-spec wood early in the process. The line includes debarking, chipping, screening, chip storage and reclaim, bark, and fines handling.

Valtokari explains that the wood supply includes short or long logs (3 to 6 m), which can be frozen or unfrozen. These are processed in different campaigns so the process can be optimized. The variable speed drives installed on both the PowerFeed™ and the RotaBarker™ provide the flexibility to process the logs with varying conditions.

The RotaBarker™ dry debarking process releases bark from the logs and immediately discharges the bark, preventing contact with the debarked log surface. This eliminates the need to wash the logs before chipping. The retention time of the logs in the RotaBarker™ is short compared to the time needed in a conventional drum.

Debarked logs are chipped to optimum size in the horizontally-fed HHQ-Chipper™, what Valtokari calls "the centerpiece of the woodyard," due to its influence on chip quality. Bark is treated in a Hooper™ bark shredder and is sold as bio fertilizer and/or biofuel.

The chip silo stores about two days of production. Chips pass through an Andritz screen with decks for accepted chips, oversize chips, and fines. The portion of accepted chips fed to the silo exceeds 90%. Oversize chips are sent to the re-chipper and fines are sent to a separate pile to be recovered as biofuel.

From the woodyard, the chips are conveyed to the main mill, which showcases Andritz's P-RC™ APMP (Preconditioning Refiner Chemical / Alkaline Peroxide Mechanical Pulping) technology. According to Christian Laser, Andritz's Project Manager for the Mechanical Pulping delivery, the APMP process "produces pulp with high quality mechanical and optical characteristics, with reduced energy consumption, and easily bio-degradable effluents. There are no sulfur compounds to deal with."

Laser walked through the main process steps: chip washing, impregnation, HC refining, screening, reject refining, and HC bleaching before the pulp is flash-dried and baled. Andritz delivered all the major systems for each process step.

Impregnation is done in two stages (Impressafiners and vertical twin-screw impregnators). Mainline HC refining uses two large Andritz S2070 refiners. Four screens (two primary, one secondary, and one reject) comprise the screening room. Rejects are handled in an Andritz TwinFlo™ refiner. The pulp is thickened with a disc filter before moving to the HC peroxide bleaching system. The bleached pulp is dewatered in a large twin wire press and then fluffed before drying.

The two-stage flash drying unit, according to Kurt Olsson, is designed for 500 t/d peak capacity. Olsson is a Senior Project Manager for Andritz's fiber drying unit in Sweden. "Flash drying is typically used for mechanical pulp because a web of pulp would not be strong enough to dry on a sheet dryer," Olsson says. "The technology gets its name from the speed with which the pulp is dried. The pulp enters the dryer at about 48% dryness and is transported by the hot air as it is being dried. Total time from input to output is about one minute. The dryness at output is about 88%. By recirculating the air we conserve energy."



▲ The two-stage flash dryer at Estonian Cell is designed for 500 t/d peak capacity.



▲ The slab press is the largest in the world. This newly designed unit by Andritz is capable of producing 500 admt/d.

▼ Margus Kohava, Mill Manager, in the warehouse. "Our customers are giving very good feedback about pulp quality."



After the pulp is dried to a dryness of about 88%, it is transported to the Andritz bale finishing line. The slab press is a new design from Andritz. "This was not just a matter of scaling up an old design," says Thomas Radauer, Andritz's Senior Product Manager. "We had to completely re-think the design to achieve high capacity."

The result is a new press with a feed chute and pre-compaction unit on top. In the pre-compaction unit, the descending pulp flocs form a mat between two belts, while the excess air is discharged through the belts via suction boxes. From the pre-compaction unit, the fiber mat enters the distribution chute and then the press itself. The compressed pulp, at 88% dryness, is conveyed to the baling for wrapping, tying, stacking, and forming export units.

### On schedule, on budget

The contractual start-up date for the mill was April 24, 2006.

"The planning and construction of this mill were big achievements, but one of the most important achievements for me was the production of the first pulp bales on March 23<sup>rd</sup>," says Margus Kohava, Mill Manager.

Another important milestone was the Provisional Acceptance test. By contract, the mill had to run for 72 hours at

design capacity producing prime quality pulp. Acceptance occurred on September 1<sup>st</sup> and Estonian Cell took over operations from the turnkey contractor RWE.

Since then, there have been a series of performance tests by grade, as well as tests of the woodyard equipment and water treatment plant, according to Riia Ratnik, Chief Financial Officer for Estonian Cell. Ratnik was the first employee hired by Estonian Cell in August 2004.

Ratnik moved back to Estonia from her job as a controlling manager for a German automotive supplier to be part of the project. "When I came to the industry, I thought that making pulp would be simple compared to discrete manufacturing. Now I know better. It requires continuous optimization. There are so many variables, you sometimes can't even foresee them all."

Ratnik and her team are using their millwide information system to analyze consumption and manufacturing costs to identify opportunities for improvement. "One area of focus, which will be a continuous process, is the optimization of costs," she says. "At first we were concerned with making production. Now we must shift our attention to consumption, energy, chemicals, etc. to fine-tune our costs."

Johannes Galos, Andritz Project Director (left), coordinated the overall project. Galos is shown discussing production with Igor Nasimov, Drying Line Operator at Estonian Cell. ▼





## Estonia

After centuries of Danish, Swedish, German, and Russian rule, Estonia attained independence in 1918. It was forcibly incorporated into the Soviet Union in 1940 and regained its freedom in 1991, with the collapse of the Soviet Union. Since the last Russian troops left in 1994, Estonia has been free to promote economic and political ties with Western Europe. It joined both NATO and the EU in the spring of 2004.

The forests have always played a key part in Estonia's survival. During the Russian occupation, groups of Estonian freedom fighters (the "Forest Brothers") hid in the forests for years, and from these deep hide-outs, raided and attacked the foreign occupiers of their country.

The capital city, Tallinn, was established in 1154 amidst the pagan lifestyle and rituals that pervaded the area. One of the world's oldest universities, the University of Tartu, was started in Estonia in 1632. Wooden buildings of this period were seen from the rich Estonian forests. A short time later in 1664, a Swedish company built the first pulp and paper mill in Estonia, once again taking advantage of the vast forests for commercial production of paper.

Modern forest management may have its roots buried in the rules created over 400 years ago. It was forbidden to cut and use trees in a zone bordering the coastline in order to protect the land from erosion of the Baltic Sea. Trees for new boats, firewood, and buildings were cut from deep in the forests and transported to the shoreline villages for use.

▲ The greenfield Estonian Cell mill is designed to produce 140,000 t/a of hardwood market pulp. It is located in northeast Estonia, just a short distance from the Baltic Sea.

Estonian Cell is in a good position with regards to energy costs, thanks to a long-term agreement with the state-owned Eesti Energia company, according to Ratnik. "Still, there are things we can do to fine-tune the energy consumption of the refiners," she says.

"Cost optimization requires good stability of production," Ratnik says. "Many days, we run at 90-100% of design. Our target is to run at 90% for the year. We know we can reach the target, but there are still days when we have operational surprises."

"The first year, we have been able to show positive financial results," the CFO explains. "Two of our owners are very experienced in the pulp and paper business, which is a big help to us. They understand what it takes to succeed."

### A respect for nature

"Estonia has very little experience and history in pulp production," Kohava says. "We have had two very old chemical pulp mills in the country, and only one is operating today. It was built in 1938."

"The biggest local concern before this mill was built was that it would be similar to the old chemical pulp mill near Kehra," Raid says. "People were concerned about potential pollution and noise."

▲ Christian Laser, Andritz's Project Manager for the Mechanical Pulping delivery.

"Nature and the forests are so much a part of our history," Ratnik explains. "Our mill design is such that the noise level at the gate is 55 db during the day and 45 db at night. The average noise level in a home is 50 db. I think people are surprised at how quiet this mill is."

"It is perhaps surprising that the government made our permit levels for water treatment stricter than most Scandinavian mills," says Kersti Luzkov, Estonian Cell's Technology Manager. "We have a complex permit which places limits on every hour of production." Luzkov oversees the company's four laboratories (water, wood, analytical, and pulp labs) that monitor quality and environmental impact. "We built an 11 km pipeline from our effluent plant to the Baltic Sea," she says. "The last 2.5 km is under the sea. The fresh water demand per tonne of pulp is about 14 m<sup>3</sup>. To my knowledge, these figures are very low."

### Fine-tuning grades and operations

The Heinzl Group handles the worldwide sales and trading of Estonian Cell's output. "We are getting very good feedback about our pulp quality from both Heinzl and our customers," Kohava says. "But since this mill is so new, we are still developing our final products in cooperation with them." Kohava admits that Estonian Cell is making more products and different

## AS Estonian Cell

As part of its scope of delivery, Andritz supplied fully integrated distributed controls for the entire Estonian Cell mill. In addition, an Andritz BaleMatic™ system automates the pulp finishing line. The systems can be monitored and supported online from a remote Andritz Automation service center. ►



Johann Unger, Andritz General Site Manager, was in charge of the overall site activities. "It's like running a small business. It's wonderful when everything comes together at the start-up!" ▼

products than it will in the future. "One of the advantages of the technology is that we can be flexible in producing products that are tailored to our customers," he says. "However, we have to rationalize our grade mix. We just need to find out what gives customers the most benefit from our pulp."

### "Learning every day."

"We wish to show the Western world that a small country is able to build and operate a modern mill," Raid says. "When the world finds out we can produce a high-quality product in an environmentally friendly way, and create jobs, we hope they will respect what we are doing here."

"This greenfield mill has been a major accomplishment," Kohava adds. "The project was well-managed. It met all the agreed time schedules and costs. It started up as scheduled. Everything went as planned. However, when you build up a mill, all the small and separate parts need to be fine-tuned. Our employees are gaining experience every day. We are all learning every day!"

►► find out more at [www.fiberspectrum.andritz.com](http://www.fiberspectrum.andritz.com)



# A refined approach to rebuilds

The TMP plant at Augusta Newsprint Company was installed in 1983. Since installation, the 11 Andritz Twin™ 50 refiners have produced over six million tons of TMP and there has never been a major failure of the equipment. The mill attributes this to a methodical refiner rebuild program which it initiated with Andritz in the 1980's. "There is too much at stake here to entrust our refiners to any other supplier," says a maintenance supervisor.



▲ David Martin (left), Maintenance Mechanical Superintendent, with Billy Watts, Andritz's Service Account Manager. "I've grown to depend upon Billy. I can call him with any question or problem and he'll get the answer for us."

Everything mechanical in a mill either wears out or breaks down over time. The key is knowing *when* to service the equipment, *who* to entrust the service to, and *what* to do during the rebuild.

Augusta Newsprint Company (ANC) has determined the *when* and the *who*. They rely upon Andritz experts to determine the *what*.

"Based upon our experience, we schedule a rebuild of the refiner's rotating assemblies every third year, and a rebuild of the housing, tubes, etc. every sixth year," says David Usry, Maintenance Supervisor and a 26-year veteran of the company.

"Andritz people know what to do," explains David Martin, Maintenance Mechanical Superintendent for ANC's pulping areas. "They spend their careers engineering and working on refiners. They have the drawings and know the dimensions. They understand the metallurgies, whether it's safe to weld on it or not."

"The maintenance experts have a more detailed view," says Brian Norris, Pulp Mill Manager, "but when you ask me what I want from a rebuild, the answer is simple. I want the refiner to operate like it was new, I want the start-up to be trouble-free, and I don't want any issues at all."

## Masters of newsprint

In addition to being home to the prestigious professional golfers Masters Tournament, Augusta, Georgia is also home to Augusta Newsprint, a joint partnership between Abitibi-Consolidated Inc. and the Woodbridge Company Ltd. In 2004, Abitibi-Consolidated added 2.5% to its 50% holdings to become the majority owner and operator.

When the mill was opened in 1966, the furnish was provided by a groundwood mill. There are two paper machines, one of 1966 vintage and the other installed during the expansion in 1983. This expansion also saw the addition of the TMP plant.

The 1100 t/d TMP mill has four lines of refiners consisting of primary and secondary Andritz Twin 50 units each driven by a 12,000 horsepower 13.8 kV synchronous motor. In addition there are three reject refiners also having 12,000 horsepower motors. The main-line refiners are pressurized (55 psi) and the reject refiners operate with atmospheric outlets.

In 1989, the groundwood mill was replaced by a 90,000 t/a recycled facility which adds about 30% secondary fiber to the furnish. "Today, we produce about 420,000 tonnes per year of standard newsprint from southern pine and recycled newspaper and magazines," Norris says. "The majority of the output is 27.7 lb. (45 g/m<sup>2</sup>) basis weight. Publishers want a lighter sheet so they can get more newspapers out of a tonne. This puts more pressure on us both technically and in a productivity sense."



▲ One of four Andritz Twin™ 50 refiners in the secondary position at Augusta Newsprint. The TMP plant produces 1100 t/d for the mill's two newsprint machines.

▼ Brian Norris, Pulp Mill Manager, says, "I want a rebuilt refiner to operate like it was new. I want the start-up to be trouble-free. And, I don't want any issues at all."



## One eye on the energy meter

When ANC's TMP plant is running wide open, it is quite power intensive. "Electrical energy accounts for 23% of our production costs," Norris says.

One interesting aspect in the pulp mill control room is a computer system that displays real-time electricity pricing to alert operators. They adjust TMP production rates to minimize the average cost of purchased energy.

"This is critically important during the utility's peak power hours in the summer," Norris says. "We don't have that much of an inventory buffer and the newsprint machines keep running. That's why it's important for us to have all the refiners ready to run at a second's notice so the paper mill has the stock it needs."

"At this mill, when we need four lines to run full-out, we have to do it, especially because of the power pricing arrangement," says Martin.

## On-going support

“Andritz has the experience and has always been there for us,” says Dave Williams, an Augusta maintenance professional. “When we have a question, they give us the answer. They deliver what they promise.”

When customer equipment arrives at Andritz’s rebuild facility in Muncy, Pennsylvania (USA), it is dismantled and carefully inspected. The results are compared to the latest specifications and reported to the customer. “Andritz people know what to do,” says David Martin, Maintenance Mechanical Superintendent. “They have the drawings and know the dimensions. They understand the metallurgies, whether it’s safe to repair or if a component should be replaced.”

Everything is done with the aim of returning the equipment back to OEM standards. Final run-off, balancing, and hydrodynamic testing are performed to ensure the equipment is “production ready.”

“When we get a rebuilt refiner back from Andritz,” Martin says, “we know it’s ready to run.”

Refiner rebuilds are just one of the services that Andritz performs for Augusta Newsprint. Augusta has teamed with Andritz for control upgrades, refiner plate improvements, and upgrades of its dewatering screw presses. During the last screw press rebuild, the units were upgraded with replaceable wear shoes, extending the life between rebuilds. The original solid design screen baskets were replaced with a split design to reduce maintenance time and costs.

“We’ve done a number of upgrades over the years,” Martin says. “For instance, we’ve worked with Andritz to upgrade the refiner plates and refiner controls on a regular basis. We continue to look at ways to improve production and control, especially if we can reduce energy consumption in the process.”

### Too much at stake

David Williams spent 18 years in the TMP plant before recently moving to the paper machine maintenance area. “I prefer maintenance over operations,” Williams says. “I’ve got grease in my veins.”

Williams remembers the original Twin™ 50 Model 1 refiners installed at ANC. “The Model 1 had a cavity behind the plate holder for balance water. This reduced the amount of hydraulic pressure needed, but we had problems with it. So, one of the first changes we did was move to the Model 2 on the mainlines. The power tubes eliminate the balance water, are much easier to maintain, and have really extended the machine life between rebuilds.”

“Quite honestly,” he continues, “we have too much at stake with the pressures and steam flows. Andritz has the experience and have always been there for us. When we have a question, they give us the answer. When we have a request, they respond. They stand behind their warranties – they deliver what they promise.”

Usry agrees. “Before moving into supervision, I was a mechanic for many years. A machine shop can guess at the dimensions and feel-fit, but Andritz has the actual drawings and the specs. From my experience with Andritz – their dependability, their turnaround times, and their expert recommendations – why go anywhere else? We’re just not willing to risk it.”



▲ David Usry, Maintenance Supervisor at Augusta, says, “We have too much at stake with the rebuilds to risk it. Andritz gives us good service – why go anywhere else?”

### Not just a rebuild

Ed Stover, who retired in February of this year after 24 years with the mill, has a long history of experience with the refiners and with Andritz. “Because I worked for Sprout at one time, I had the knowledge to do refiner rebuilds,” Stover says. “So for the first four or five years, we did the rebuilds ourselves.” According to Stover, the logistics of managing the rebuilds became a real burden. “I had to send my rotors to one place, the plate holders to a different place, and the casings to still another location. Trying to keep track of all that, and managing the vendors to meet their deliveries was a headache.”

“The other thing that always worried me,” he continues, “was the interchangeability of components. With 11 refiners, we want to match parts of one refiner to another. I resisted going to the other suppliers because they all tend to make changes to the original design. If Andritz makes a change to the design, they document it so that if we ever need parts, they know what is needed and have it readily available.”

After a few headaches, Stover and his colleagues did a cost analysis to see how much they were saving by doing rebuilds themselves. “With all the logistics and transport, plus our own people’s time, we really weren’t saving anything,” Stover says. “From a cost standpoint, it was about equal to send the units to Andritz.”

### Good cooperation

One of the added benefits of Andritz’s rebuild service is having access to “the latest and greatest,” according to Stover. “Anything new they come up with, they ask us if we want to include it in the rebuild. This way, over the years, we improved the hydraulic cylinders, upgraded the ribbon feeders, significantly improved bearing life, and enhanced the metallurgy of the rotating discs themselves. We could not have done this with a third-party supplier.”

“It has been really important to us to have such a good cooperation with Andritz,” Martin says. “I’ve grown to depend upon Billy Watts (Andritz Customer Service rep) as an extension of our mill personnel.”

“It’s true that price is a major consideration,” Martin concludes, “but so is knowing that what we’re buying is going to work.”

►► find out more at [www.fiberspectrum.andritz.com](http://www.fiberspectrum.andritz.com)

Mike McLaughlin (right), Head of Andritz’s Automation group in North America, was part of the start-up team when Augusta installed their refiners in 1983. Here he discusses refiner control with Mike Harrell, Pulp Mill Operator at Augusta Newsprint. ▼



◀ A technician performs a visual inspection of Augusta Newsprint’s Twin™ 50 refiner before it is rebuilt at Andritz’s Muncy, PA (USA) facility.

# Upgrading a mill step-by-step

“When you upgrade a mill, you have to rely heavily on your own knowledge,” says the Director of Engineering and Maintenance at the Zellstoff Pöls mill in Austria. “You also must rely on supplier-partners with excellent knowledge.” The Pöls mill is working steadily to increase pulp capacity. One of its latest investments is a white liquor plant supplied by Andritz. Record pulp production was achieved in the first month after start-up.



▲ Josef Kreuzer, Director of Engineering and Maintenance. “We have a master plan for upgrading the mill step-by-step.”

What do lime kilns, chip bins, slakers, high-pressure feeders, twin wire presses, lime mud filters, and pulp dryers have in common?

Walter Sommerbauer knows – and so do the people at Heinzl Pulp’s mill in Pöls, Austria.

Sommerbauer is Andritz’s Customer Service Manager at the Pöls mill. As Andritz has been a technology and service partner with Zellstoff Pöls on a series of projects to de-bottleneck and upgrade, it has been Sommerbauer’s role to coordinate the communications and make sure the customer is happy.

“We work with a variety of technical specialists, coordinated by one representative from one company,” says Siegfried Gruber, Head of Project Engineering at Pöls. “We see many faces, but it’s all one Andritz.”

## The master plan

“This mill has a lot of potential,” says Josef Kreuzer as he looks out over the Zellstoff Pöls complex from his office window. Kreuzer came to Pöls in 2002 after meeting Alfred Heinzl and learning about plans for expanding the Zellstoff Pöls mill.

“Mr. Heinzl explained to me his long-term goal to become one of the largest pulp, paperboard, and paper traders and to be a respectable market pulp and paperboard manufacturer in Europe,” Kreuzer says. “He asked me to be a part of the team and I gladly accepted.”

The first task was to prepare a concept for what the mill could look like in five

to 10 years. The target was to not only upgrade the pulp mill, but to add a large paper or board machine.

“We did most of the studies ourselves,” Kreuzer says. “Our people know best how to run the mill and where the obstacles are in our path. We defined the steps for upgrading the pulp mill to 450,000 t/a, adding a board machine in the range of 350,000 t/a, and installing a biomass power plant with 60 MW thermal load (or 20 MW electricity load).”

The first step of the concept to upgrade the pulp mill was approved by the Heinzl Group. Because of the size of the proposed expansion, the next step was to do an environmental impact assessment. This process was protracted to about two years and cost Pöls a couple of million euros.

“We finally received the environmental permit in July 2005,” Kreuzer says. “And now each day we are moving forward.”

Most of the mill’s main equipment is now sized to sustain 1300 t/d average production, with the capacity to handle 10% peaks. Plans are in place to upgrade or replace the remaining equipment step-by-step.

## Removing a big bottleneck

“We had been increasing our pulp production to the point where the biggest bottleneck was our kiln and recausticizing equipment,” says Bernhard Bauer, Project Engineer at Pöls. Bauer was the Project Manager for the new Andritz white liquor plant that replaced the old technology.



The old lime kiln, which was installed in 1983, was tremendously overloaded. In 1997, it was upgraded to bring its capacity to about 290 t/d of lime. The price for this capacity increase was short refractory life, high energy consumption, and NO<sub>x</sub> emissions that were pushing the limits. Pushing the capacity in the kiln also created fluctuations in white liquor quality which caused problems in the cooking plant.

“With this background, and with our goals set on production of 450,000 t/a of pulp,” Bauer says, “we decided to invest in a new larger kiln.”

The investment decision was made in June 2005 to replace the old kiln and recaust equipment. “Then we started to send our inquiries and check references for potential suppliers,” Bauer says.

Since the mill is nestled so closely to the small community, special efforts are taken to reduce noise and the environmental impact of the mill. The Pöls evaluation team visited several mills, including UPM’s Wisaforest mill in Finland, to see Andritz’s white liquor plant in operation.

“The recovery island of Wisaforest was very clean and very impressive,” says Michael Bauer, Assistant Production Manager from Zellstoff Pöls (no relation to Bernhard Bauer). “One of the advantages that we saw in doing business with Andritz was our ability to single-source the whole white liquor plant from one supplier. We also liked the new technology of the LMD-Filter™ for drying lime mud. The filter has certain benefits in that it produces a higher quality lime and lowers the emissions.”



▲ Zellstoff Pöls is one of the major producers of ECF bleached softwood pulp in Central Europe. Environmental excellence is still a strong attribute. About 600 homes in the Pöls community are heated through a district heating network connected to the mill’s process systems.

One interesting aspect of the white liquor plant is the architecture of the facility itself. The exterior walls are designed in a “sandwich” structure to more efficiently heat and cool the building’s interior.

▼ Bernhard Bauer (left), Project Manager, with Michael Bauer, Assistant Production Manager, in front of the new Andritz kiln.







▲ Part of the scope of Andritz's delivery was this CD-Filter which produces excellent white liquor purity.



▲ The two-stage washing capability of the LMD-Filter™ from Andritz is meeting the mill's requirements for lime mud dryness and low emissions perfectly, according to Michael Bauer, Assistant Production Manager.

"Originally, Andritz proposed using conventional filtering technology," Michael Bauer says. "But, when we met with the specialists in Kotka, they presented the idea of a two-stage LMD-Filter™ to obtain better quality lime mud and also reduce H<sub>2</sub>S emissions."

"As you can see, we are in the middle of a village here," Bernhard Bauer says. "We have to think carefully about emissions from our processes."

"This is the first two-stage lime mud filtering system in the world," says Michael Bauer. "When Andritz presented the concept, we said why not try it? Previously, we had four washing stages for the lime mud. We developed this two-stage system together with Andritz and it meets our needs perfectly."

### A challenging schedule

The original project plan was to complete the installation of the white liquor plant in 20 months. In the background, Pöls had applied for revisions to its environmental permits in order to increase production. However, the permitting process took longer than expected.

"Due to these delays, we had only 16 months to complete the project, including engineering," Bernhard Bauer says. "We put the challenge to Andritz if they would be able to complete the project in 16 months instead of the planned 20. They promised they would do it."

Unfortunately, in 2005, the Pöls community suffered through a hard winter – not the ideal time to be doing civil, structural, and erection work. "We

couldn't push the schedule even though some of the logistics were complex," Bauer says. "For example, transport of the kiln shell (the longest section being 57 m long by 4 m diameter) required carefully orchestrated steps with the transport companies and authorities for its 2500 km journey from Finland. We weren't going to delay that."

The kiln shell sections arrived on-site in January 2006. "There were days when the temperature would be -20° C," Bauer says. "And, lots of snow. Conditions were not the best, but everyone did a good job."

Due to the tight schedule and tough conditions, Andritz offered to have its Project Manager remain on-site at Pöls from the first delivery in 2006. "I was able to better coordinate with Finland and with the local suppliers to ensure that we stayed on schedule," says Erkki Osmonsalo, Project Manager from Andritz.

"It was the right decision to have Erkki on-site," Bauer says. "It's perhaps a little unusual for the project manager to be on-site all the time, but it really helped."

In April, the instrumentation and automation equipment was installed. The work was performed by the Andritz Automation group in Graz. Rudolf Mayböck, Senior Engineer in the Electrical and Automation group, supervised the work for Andritz.

"We were responsible for the power supply, distribution, instrumentation, and controls for the recausticizing equipment and the kiln," Mayböck says.

"This included all plant software and the burner safety system. Soon, we hope that Pöls will install our BrainWave® adaptive and predictive controllers to get tighter control of the kiln. This controller and the Kiln ACE® optimization software will help Pöls reduce their energy costs and improve the lime quality even further."

Erection was completed at the end of August 2006 and commissioning began. The first burner start occurred in October. At Bauer's request, Andritz brought its most experienced commissioning and start-up team to Pöls.

### White liquor party

"Our original plan was that we would begin production in October 2006 and we were on time – so it was excellent," Bernhard Bauer says. When the first white liquor from the new system filled the white liquor tank, the team could finally celebrate. "We had a white liquor party with our own version of white liquor," Bauer laughs. "This was also very fine!"

The Andritz white liquor plant is designed to produce 5700 m<sup>3</sup>/d of white liquor for Zellstoff Pöls' fiberline. The kiln is designed for 440 t/d of reburned lime.

"The lime mud filter has worked exactly as we hoped," Michael Bauer says. "With the old system on a good day we could reach 75% dryness. With the new LMD-Filter™, we can exceed 80%."

## Zellstoff Pöls AG

### Fiberline upgrades

Zellstoff Pöls installed its continuous digester in 1983. The digester had a vibrating chip bin as part of the feeding system. The design capacity at the time was 620 adt/d, according to Siegfried Gruber.

Today, after a series of upgrades, the digester produces about 1150 adt/d. Plans are to increase capacity even further to 1300 t/d over the next few years. Furnish is 70% spruce and 30% pine.

In 1997, Andritz was selected to upgrade the chip feeding system with a Diamondback® chip bin. Gruber says the old chip bin became very maintenance-prone due to its vibrating, moving parts.

The Diamondback® has no moving parts, relying instead upon gravity and its unique geometry to pre-steam and transport the chips.

Initially, Pöls experienced some problems with bridging between the first and second cone sections of the silo. "The problems were most evident in the winter time," says Gruber. "After analysis we came to the conclusion with Andritz that our silo was not tall enough."

The bin was extended by 2.3 m in 2003 and two deflector rings were installed to control the compaction of the chips in the bottom of the silo for better steam penetration. "After this rebuild, the silo really operated well," Gruber says. In 2005 the bin was extended another 2.5 m to increase capacity and a third deflector ring was installed. Pöls has the first Diamondback® bin in the world with three deflector rings. "We can have a load in the silo of about 250 tonnes of chips now and fill it completely."



▲ The fiberline at Pöls has been upgraded several times over its life and currently produces about 1150 adt/d. Andritz supplied a Diamondback® chip silo to upgrade the feed to the digester.



▲ Looking over the Diamondback® chip bin system are Walter Sommerbauer, Andritz Customer Service Manager (left), and Siegfried Gruber, Head of Project Engineering for Pöls.

◀ Shown from left to right:

Front: Josef Kreuzer, Director of Engineering and Maintenance; Walter Sommerbauer, Customer Service Manager from Andritz; Michael Bauer, Assistant Production Manager; Heinz Kaiser, Product Engineer; Eduard Mayerl, Assistant Production Manager.

Middle: Harald Trummer, Head of Maintenance; Bernhard Bauer (standing), Project Engineer.

Rear: Jürgen Rieger, Assistant Production Manager; Alois Jammerneg, Product and Start-up Engineer Dewatering & Bleaching; Bruno Prenoler, Project Engineer; Siegfried Gruber, Head of Project Engineering; Manfred Enzinger (standing), Maintenance Planning.



## Improved pulp drying

Pöls has both flash and sheet drying systems operating in the mill. While it produces about 13,000 t/a of its own specialty paper on a small machine at the site, the majority of pulp is dried and sold to market under the ORION brand name. Capacity of the flash dryer is 378 t/d.

Before 1997, Pöls had an old fourdrinier drying machine, according to Jürgen Rieger, Assistant Production Manager at Pöls. In 1997, the machine was overhauled to add an Andritz wet end (including a twin wire dewatering press), add new coils in the Fläkt dryer, and install a new cutter. Production increased from 520 to 690 t/d.

In 2000, Andritz rebuilt the twin wire press too.

In 2004, some small improvements were made to the dewatering unit (changing from steel to rubber rolls, etc.). Andritz also performed an audit of the dryer and proposed some upgrade suggestions to boost production to 800 t/d.

In 2005, Andritz began work to install a new fan pump, rebuild the dryer to increase the steam pressure, and to replace the gearboxes and drives on the press. A new lubrication inspection system has been added to increase bearing life. The rebuilt twin wire press is now the world's fastest – operating at 145 m/min.

"The target after the rebuild was to achieve 785 t/d production from the dryer," Rieger says. "In reality, we're running at about 830 t/d now. So, I would say the upgrade has been very successful."

"We have also experimented with many felts and wires in different positions on the press," says Rieger. "Andritz made improvements to the felt conditioning system and modified the side plates on the twin wire press so that we now get record life out of our wires – about one year. The wire and felt suppliers are not so happy with this, but it's good for us!"



In October 2006, after the start-up of the new white liquor plant, Zellstoff Pöls achieved record pulp production, about 1400 t/d. Normal daily production is about 1100 t/d.

"This is very unusual," Bauer says. "Usually after a start-up, there is an adjustment period where production may suffer. Especially with a new white liquor that the fiberline had to adjust for, this is quite an achievement."

### A good partnership from both sides

"Today, we have realized about 50% of the total investment to reach the 450,000 t/a level of production," Kreuzer says. "We have upgraded the digester including the fiberline, upgraded the drying lines, built the new white liquor plant, upgraded the recovery boiler, etc. We are now at a level of 375,000 t/a."

Kreuzer points with pride to the time efficiency in the Zellstoff Pöls mill. "Our total time efficiency in 2006 was 96%, including the May shutdown," he says. "This is based upon 365 days total potential operation, so equipment availability is outstanding. We have production, maintenance, and technical people from our side working with experts from Andritz's side. This, to me, is a good partnership because everyone is involved and working toward our common goals."

►► find out more at [www.fiberspectrum.andritz.com](http://www.fiberspectrum.andritz.com)

◀ Andritz provided a major rebuild to the sheet drying machine by installing a twin wire dewatering press and making other modifications. The dryer's capacity is now about 830 t/d. Shown are Heinz Kaiser, Project Engineer (left) and Jürgen Rieger, Assistant Production Manager at Pöls.



▲ Manfred Enzinger, Maintenance Planning of Zellstoff Pöls (left), discusses the benefits of the low-pressure feeder after the rebuild with Walter Sommerbauer, Andritz Customer Service Manager.

## Rebuilding key equipment

Andritz was selected to rebuild the high-pressure and low-pressure feeders for the digester's feed system even though Pöls had been using another vendor for years, according to Harald Trummer, Head of Maintenance for the mill.

"We had been routinely sending the units to the original manufacturer in Sweden," Trummer continues, "but we began to have problems with cracks re-appearing inside the feeder and in the housing. The time between rebuilds was getting shorter. This indicated to us that there were problems with the overlay welding, which is the most critical step in the rebuild. Also, the communications was not very good, as the supplier did not keep us informed about what steps they were taking to repair the feeders."

Andritz was invited to bid on the next rebuild and won the order. The first test was rebuilding a high-pressure feeder in 2003. "We checked the work very carefully, since it was done nearby in the Graz facility," Trummer explains.

Based upon the initial success, Pöls now entrusts Andritz with rebuilding its low-pressure feeders, too. "The communications between the two companies has been very good," Trummer says. "The rebuild work, too, has been excellent."



◀ "This is a good partnership." Walking together are (left to right) Manfred Enzinger, Maintenance Planning, Walter Sommerbauer of Andritz, and Harald Trummer, Head of Maintenance for Zellstoff Pöls.

# SC-A Plus puts Summa on top

In Latin, the word “summa” means “highest.” Stora Enso’s Summa mill was motivated to stay on top of its competition by “re-inventing” itself with a new grade structure. Andritz was there to help. The centerpiece of a major machine rebuild is the new multi-nip calender from Andritz Küsters.



▲ “Competition is what keeps our mills efficient,” says Juha Mäkimattila, Mill Manager for Stora Enso’s Summa, Finland mill.

With sales to more than 70 countries, Stora Enso has developed a global production strategy designed to increase efficiency and profit. The strategy is based not only upon an analysis of its competition, but also upon the capabilities of each of its mills around the world. This balance of internal teamwork and internal competition provided the momentum for the Summa mill to move from standard newsprint to value-added SC-A Plus grades to stay one step ahead of the competition – internally and externally.

“Competition is what keeps our mills efficient, our costs low, and our quality high,” says Juha Mäkimattila, Mill Manager for the Summa mill. “The idea is that every mill is measured not only by its results, but also by its prospects for growth and competitiveness.”

The Summa mill was founded in 1953 on the south coast of Finland near Hamina. The first paper machine started production in 1955. PM2 followed three years later, and a third machine was added in 1972. The mill has been producing standard newsprint for years.

## Then came Langerbrugge

When Stora Enso built the new PM4 at Langerbrugge in Belgium, it created a modern and massive newsprint production line. Other mills in the Stora Enso network could not compete with the size, speed, and efficiency of the Langerbrugge machine (10.3 m width and 2000 m/min design speed).

The new machine created a challenge for Summa, as standard newsprint production at the mill was no longer an option for growth.

“We had to deal with the cost of three machines, while our production was approximately down to one and a half machines,” Mäkimattila says. “We finally had to shut down PM1 completely.”

## Time for new thinking

Since the future was not going to be in standard newsprint, Summa’s Production Manager Antti Outinen reasoned that adding SC-A Plus grades to the product range would add value for the company. With the advantage of the Scandinavian spruce fibers, and his team’s dedication to continuous improvement, the outcome looked promising. Now to convince top management to make the investment.

Stora Enso invested € 90 million to prepare Summa for the new grades – adding a new peroxide bleaching stage, new quality-based tools to regulate a stock fractionation system, and a new PrimeCal ProSoft multi-nip calender to produce machine-finished (MF) papers.

Today, Summa’s PM2 produces SC-A Plus under the brand name MagniPress Bulky, and MF magazine paper under the SilvaPress name. The volume ratio in the paper is decisively improved – reaching more than 1.0 cm<sup>3</sup>/g. This, plus a roughness below 1.5 pps and a gloss higher than 45%, create a paper with excellent printability, according to Stora Enso’s key customers.

A dozen customer companies were invited to test the paper in its early stages. The 15% increased bulk, the smoothness that gave the feel of coated paper, and the economic advantage of reduced grammage were quite convincing.

## Radical changes

Making that kind of shift in grade structure requires some radical changes. This was not a problem for the team at Summa. They were accustomed to change and willingly looked at ways to continuously improve. The necessary changes to stock preparation, PM2, and paper finishing were planned and executed with precision.

The first changes were to the fiber preparation area. Here, Andritz played a significant part in optimizing the TMP plant with Summa specialists. Andritz also supplied a new peroxide bleaching stage to increase the stock brightness. Consumption of bleaching chemicals and fresh water use was reduced as the brightness of the pulp was increased.

The main changes were to the paper machine itself. PM2, originally built in 1958, had been modernized in the 1990’s and again in 2000. An interesting part of the rebuild was the implementation of the “Firewall Concept,” developed by the Summa team. With it, operators could allocate different feedstock qualities to PM2 and PM3 and optimize the product quality of both machines. If for any reason the stock did not match the quality requirements for SC-A Plus, it would be used for other grades.

The focus of the rebuild was PM2’s finishing section. “We wanted to install the best possible calendering system,” Mäkimattila explains. “That’s why we selected Andritz Küsters. Their calendering system was proven at Langerbrugge. The online calender achieves high temperatures, perfect nip-load, and excellent steam regulation. With



The focus to PM2’s rebuild was the finishing section. ▲ Above: The Andritz Küsters PrimeCal ProSoft calender system consists of two pairs of frames with five rolls each, including PrimeRoll MHV zone-controlled rolls. ▼ Below: An operator checks the profiles on the ProSoft system. Paper widths up to 7.3 m can be calendered at production speeds up to 1600 m/min.





▲ Production Manager Antti Outinen is proud of the unique combination of fiber preparation, Summa's own "Firewall Concept" and a high-tech finishing section.

## Stora Enso

that reference, we trusted Andritz Küsters' competence."

Once the contract was signed, the work was fulfilled in about 12 months. The PrimeCal ProSoft calender was manufactured in Germany and assembled before it was dismantled and delivered to Finland for final erection.

### Design stage

Right from the design stage of the project, Andritz Küsters played a significant part in the process. Several test runs at the company's Technical Center in Krefeld, Germany helped Summa to determine the specifics of SC-A Plus paper and the technical parameters for their machine rebuild.

Andritz Küsters had to redesign its ProSoft concept a little to be able to retrofit it to Summa's machine. At Langerbrugge, the paper web is transferred to the first calender stack from above. However, at Summa the usual top-to-bottom route was not practical. Significant machine structural changes were avoided by using a rather unusual

bottom-to-top route – also making the Summa machine unique.

### Impressive machine

The PrimeCal ProSoft calender consists of two pairs of frames, each carrying five rolls. The top and bottom rolls are PrimeRoll MHV zone-controlled rolls. Also in each stack are two heated steel rolls and a conventional roll.

While the conventional rolls must only be manufactured precisely, the thermo roll's most important qualities are consistency in temperature and resilience. The PrimeRoll MHV (Multi-HV technology) rolls weigh 33 tonnes each, have a product width of 7.3 m, and operate at a production speed of 1600 m/min.

The two-stack construction of the 580-tonne calender system ensures an extraordinary high rigidity of the entire machine.

The whole system is 7.5 m high and has a length of 9.5 m between the feeding system and transfer to the winder. That makes a distance of about 48 m

for the paper to travel through the calander – a trip which it completes in only 1.8 seconds.

One other aspect of the design is the MultiMaster control system, which monitors the important components of the calender and regulates the drive of every single roll. The adjustment with MHV technology offers even more possibilities to improve the paper and the machine's performance.

### Smooth start-up

After a smooth assembly and start-up, the system was handed over to Stora Enso Summa in March 2005. According to the mill, all expectations have been fulfilled. Originally designed at a roll temperature of up to 180°C, the calander today reaches 190°C. Production speed of 1600 m/min, paper width up to 7.3 m, and nip loads to 500 kN/m complete the picture. Approximately 183,000 tonnes of paper (7.6% more than originally calculated) are produced on PM2.

### Excellent results

Besides the capacity figures, the paper specifications are very satisfying to Summa. For the basis weight range produced (48-60 g/m<sup>2</sup>), D65 brightness is 75% and gloss is 45%.

The smoothness stays at 1.5 µm and the volume is up to 1.1 cm<sup>3</sup>/g. The rebuild of the PM2 contributes to a positive development in results, according to Summa management.

"The more complex the technology gets, the more important it is to train our operators to monitor the machine's parameters," Mäkimattila says. "The project does not end with taking over the delivered systems. We want to maintain a long-term partnership with at least those suppliers who built the core components."

►► find out more at [www.fiberspectrum.andritz.com](http://www.fiberspectrum.andritz.com)

## Stora Enso Summa

**Location:**  
Hamina (southern coast of Finland – 150 km from Helsinki)

**Product range:**  
SC-A plus, MF magazine, newsprint and bulky paper

**Brand names:**  
MagniPress Bulky, SilvaPress, NewsPress, ExoPress, LibroBook

**Raw material:** Spruce fiber

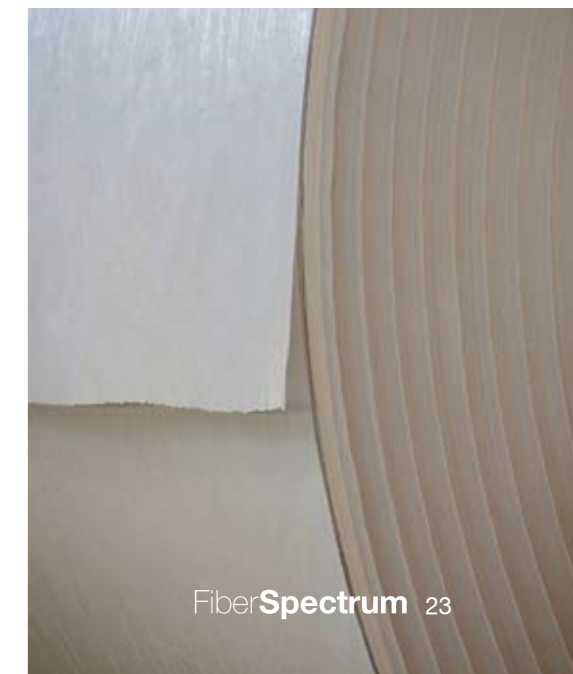
**Paper machines:**  
PM2 6720 mm trim, 1200 m/min, 183,000 t/a  
PM3 7650 mm trim, 1500 m/min, 230,000 t/a

**Personnel:** 430 employees



◀ Shown from bottom to top on the Andritz twin wire press in the new peroxide bleach plant are Vesa Holm, Supervisor, Harri Taipale, Production Engineer, and Jorma Latva-Kokko, Production Manager, at the Summa mill. In total, there are five such presses in the bleach plant, which is designed to produce 560 adm/d of 80+ ISO brightness on TMP grades.

The unique combination of bulk and high brightness in Summa's SC-A Plus MagniPress Bulky grades is very much in demand by Stora Enso's customers. ►



# Being a good neighbor

Suzano Papel e Celulose and the city of Suzano have been interconnected since the mill was founded in 1924. “Most of the people working here are living in this same community,” says the mill’s pulp production manager. Its location in the community and proximity to São Paulo require Suzano to keep emissions and effluents within very strict limits. Andritz helped the mill be a good neighbor by installing technology to reduce the odor from Suzano’s two recovery boilers.



José Alexandre de Morais, Suzano’s Manager of Pulp Production, Recovery and Utilities. ▲

## This is a story of two Suzanos – the city and the company.

Suzano, the city, is 45 km from São Paulo in Brazil. With its 270,000 inhabitants, and the 360,000 population of nearby Mogi das Cruzes, the cities encircle a large integrated pulp and paper mill.

Suzano, the company, owns the mill. The mill is one of four that Suzano Papel e Celulose owns in Brazil. Suzano is one of South America’s largest integrated pulp and paper producers. It was, in fact, the first company to utilize 100% eucalyptus for the production of printing and writing grades.

The city and the company are intertwined. “Most people who work here, live here,” says José Alexandre de Morais, Manager of Pulp Production, Recovery, and Utilities. “I also live near here with my family. The reason the mill can survive in this location is that we work very closely with the local community.”

## Tough on TRS

The location of the mill close to the cities of Suzano and Mogi is part of the reason for the strict TRS permit limits, according to Isaias Shimura, a Process Engineer in the Recovery and Utilities department. Total Reduced Sulfur (TRS) is a measure of the total concentration of bad-smelling sulfur compounds released when pulp is cooked, washed, evaporated, or when the spent

cooking liquor is burned for chemical and energy recovery.

“TRS gases are the source of the pulp mill odor,” Shimura says. “It’s what our neighbors refer to when they talk about the smell of the mill. To be good neighbors, we have to do everything possible to eliminate the bad smells.”

The main sources of TRS are the digesters, the evaporators, the lime kiln, the incinerator, and the recovery boilers. According to Shimura, TRS is currently measured at five points: the two lime kilns, the incinerator, and the two recovery boilers.

“We have been on a step-by-step program to address each source of TRS over the years, since we are located in the city,” Shimura says. As part of the upgrade program, Andritz retrofitted one of Suzano’s kilns and the recausticizing plant in 2002-2003. This included the installation of a new slaker, two reactors, and retrofitting the kiln with Sector Coolers and an LMD section.

## Removing the last of the odors

“Prior to 2005, the biggest remaining odor was coming from the dissolving tanks of our two recovery boilers” says Mario Hiroshi Ito, Project Engineer at Suzano.

The smallest recovery boiler, a Götaverken model built in 1973, burns



Good neighbors. Residents of Suzano walk the streets in front of their homes. In the background is one of the recovery boilers that now benefits from Andritz technology to reduce odor. ▲



The cities of Suzano and Mogi das Cruzes, with their combined 630,000 inhabitants, completely encircle the integrated mill owned by Suzano Papel e Celulose. ▲

860 tds/d of black liquor. The CBC (Mitsubishi) boiler was installed in 1987 and burns 1540 tds/d.

Shimura explains, “After combustion, the black liquor turns into molten ash that collects in the bottom of the recovery furnace. This molten ash (smelt) flows into a dissolving tank. The smelt is mixed with weak white liquor from the recausticizing plant.”

“Typically, the vent stack from the dissolving tank is a major TRS emissions point,” explains João Guilherme Heinz Cruz, an Andritz Service Engineer for recovery boilers and evaporators. “The concentration of TRS emissions from a dissolving tank vent stack can be five to ten times higher than in the recovery boiler’s flue gases. The vent stack is also a significant source of particulate emissions.”

“That smell is not acceptable to our community,” Ito says. We knew we would have to stop venting the gases to the atmosphere and close the system.”

## Burning instead of venting

Most dissolving tank emissions are controlled by wet gas scrubbers, where the TRS is washed from the gases before they are vented to the atmosphere. In Suzano’s case, since the mill did not wish to vent gases from the dissolving tank into the atmosphere, the decision was to go with Andritz technology for burning the gases in the recovery boiler.

“The Andritz Dissolving Tank Vent Gas (DTVG) system solves the odor and particulate problems in a unique way,” Cruz explains. “Rather than try to scrub the TRS from the dissolving tank gases and then vent them, we condensate the moisture out of the gases so they can be used in the recovery boiler. Today, it is very common to feed the gases from the dissolving tank to the recovery boiler as part of the combustion air. This has many advantages, including oxidizing the TRS compounds in the recovery furnace and eliminating particulate coming from the vent stack.”

“Andritz has very good technology and the equipment is high quality,” Morais says. “We checked Andritz’s references in this area and were satisfied that they could do the job.”

In the DTVG system, vent gases from the dissolving tank are cooled and washed in the scrubber. Gas enters the lower section of the scrubber vessel and passes through stainless steel packing material and a direct-contact heat transfer surface. The packing material is kept wet with water that is circulated through a heat exchanger. A significant portion of the gas condenses when it passes through the packing material. Excess water is returned to the smelt dissolving tank.

Before leaving the scrubber vessel, the cooled gas passes through a demister to remove water droplets from the gas. From the scrubber, the gases are transported by a fan to the tertiary air system of the recovery boiler.

The Andritz DTVG technology installed at Suzano conditions the gases in the smelt dissolving tanks so they can be burned in the recovery boilers. TRS emissions from the tanks are eliminated. ▼



## Suzano Papel e Celulose



Looking inside the condensing scrubber vessel on the CBC boiler are Isaias Shimura, Recovery Process Engineer for Suzano (left) and João Guilherme Heinz Cruz, Service Engineer for Andritz. ▲

In order to keep the gas ducts dry and the gas/air temperature high, fresh make-up air is heated and mixed with the cool vent gases.

“This technology eliminates the need for scrubbing chemicals, reduces the chances of plugging the scrubber, and also can recover wasted thermal energy,” Cruz says. “It is an effective and less costly solution.”

### First success leads to follow-on project

In early 2005, Suzano contracted with Andritz to install the first DTVG system on the older, smaller Götaverken boiler (installed in 1973). Andritz delivered the project on a modified EPC basis, according to Morais, with Suzano providing the civil works and instrumentation. “The project was completed on schedule and the overall performance has been very good,” Morais says. “The flows, temperatures, and burning of the gases in the recovery boiler have been no problem for us.”

Before the first project was fully commissioned in November 2005, Suzano asked Andritz to retrofit the second recovery boiler (the CBC unit installed in 1987).

For this installation, Suzano wanted to retain as much equipment as possible, so the existing fans and heat exchangers were included in the Andritz DTVG design. Additional heat exchangers were installed by Andritz to handle the capacity for circulating and cooling waters.

In the first quarter of 2006, the basic engineering was completed for the project. During the scheduled boiler shutdown in July, Andritz did as much as possible to prepare the tie-ins to the existing boiler systems. In early October, construction started. Twenty days later, the DTVG system was started up. Everything was operational by November 2006.

►► find out more at [www.fiberspectrum.andritz.com](http://www.fiberspectrum.andritz.com)



Milton Roberto de Mattos Carreiro, Supervisor of Recovery and Utilities (left), and João Guilherme Heinz Cruz, Service Engineer for Andritz. ▲

## Suzano Papel e Celulose

Eighty-three years ago, Leon Feffer began investing in the pulp and paper industry in Brazil. Eventually, he sold all his assets to build a paper mill near São Paulo. Feffer took the name of the town, Suzano, to become the name for his company. In the 1950's, Suzano became a pioneer in the development of eucalyptus pulp and was the first to use this fiber for printing and writing grades.

Today, the Suzano Group is still majority-owned by the Feffer family. The Group is active in Pulp & Paper and Petrochemical sectors. Suzano Papel e Celulose has revenues of about US\$ 1.42 billion and production capacity of 640,000 tons of pulp and 1,080,000 tons of paper. It produces coated papers, uncoated papers, paperboard, and bleached eucalyptus kraft pulp.

With the addition of a second pulp line at its Murcuri mill (to be completed in 2007), Suzano will increase its production of pulp by one million tonnes per year. Andritz is providing the wood-yard and a 3160 t/d fiberline (washing, screening, and bleaching systems) on an EPC basis for the Murcuri project.

Suzano has embarked on a unique program, the Beekeeping Development Program, to offer jobs and income generation through honey production in the regions near the company's plantations. It turns out that eucalyptus flowers are excellent for beekeeping. Suzano trains local residents and provides the materials (hives, protective clothing, and other materials). Beekeeping is one of 40 such programs developed by Suzano which reach out to 630,000 people.



◀ Discussing the performance of the Andritz DTVG technology are Suzano's team (left to right): Marcos Abdalla, Project Coordinator for both installations, Mario Hiroshi Ito, Project Engineer, Marcos Pessotta, Recovery and Utilities Coordinator, and José Alexandre de Morais, Suzano's Manager of Pulp Production, Recovery and Utilities.

The Andritz DTVG technology was first installed on this 1973-vintage Götaverken recovery boiler. Based upon the success of this project, Suzano immediately ordered a system for their second boiler (a CBC unit installed in 1987). ►



# New Orders

## ► Complete Lines

### Wood Processing

Complete Lines & Systems

**Temple Inland**  
**Diboll, Texas, USA**  
Turnkey tree length debarking, portal crane

**Sappi Saiccor**  
**Umkomaas, South Africa**  
Chipping/chip handling

Key Equipment

**Tokai Pulp & Paper (Shimada Mill)**  
**Shizuoka, Japan**  
Help bin

**Sappi Austria**  
**Gratkorn, Austria**  
Bark shredder

**Yanzhou Heli Paper Industry**  
**Yanzhou, Shandong, China**  
3 CenterScrew™ slewing screw reclaimers for chip handling

**Sappi Saiccor**  
**Umkomaas, South Africa**  
Help bin

### Fiberline

Complete Lines & Systems

**UPM-Kymmene (Kymi Mill)**  
**Kuusankoski, Finland**  
TurboFeed® chip feeding system and Diamondback® chip bin

**Domtar Industries**  
**Ashdod, Arkansas, USA**  
TurboFeed® chip feeding system, Diamondback® chip bin and flash tank RETRO-fit™ upgrades

**SFK Pulp**  
**St-Félicien, Quebec, Canada**  
Blowline pressure diffuser system

Key Equipment

**Sichuan Yong Feng Paper**  
**Muchuan, Sichuan, China**  
Screening and MC components

Upgrades & Modernizations

**Stora Enso (Varkaus Mill)**  
**Varkaus, Finland**  
Chip presteaming: Diamondback® chip bin, TurboFeed® system and vapor reboiler

**MeadWestvaco**  
**Evadale, Texas, USA**  
Downflow Lo-Solids® cooking

### Recovery

Complete Lines & Systems

**Ence (Pulp Mill Navia)**  
**Navia (Asturias), Spain**  
Recovery boiler and power boiler  
*First recovery and power boiler package supplied by Andritz*

**Lwarcel Celulose e Papel**  
**Lencóis Paulista, Brazil**  
Ash leaching chloride removal  
*First chloride removal system based on ESP ash bleaching*

**Sun Paper**  
**Yangzhou, Shandong, China**  
MVR Zedivap evaporator

Key Equipment

**Confidential customer**  
**China**  
2 TMP reboilers

**UPM-Kymmene (Kymi Mill)**  
**Kuusankoski, Finland**  
Vapor reboiler

**Petrozavodskmash**  
**Shklov, Belarus**  
TMP reboiler

**Stora Enso (Varkaus Mill)**  
**Varkaus, Finland**  
Vapor reboiler

Upgrades & Modernizations

**Ence (Pulp Mill Navia)**  
**Navia (Asturias), Spain**  
Evaporation plant upgrade

**Mondi Packaging**  
**Stambolijski, Bulgaria**  
Evaporation plant upgrade

**Aracruz Celulose**  
**Barra do Riacho, Brazil**  
Recovery boiler upgrade

**Smurfit Kappa**  
**Nettingsdorf, Austria**  
Evaporation plant upgrade

### Pulp Drying & Finishing

Upgrades & Modernizations

**Pitkyaranta Pulp Works**  
**Karelia, Russia**  
Wet end rebuild

**Jari Celulose**  
**Almeirim, Para, Brazil**  
Dryer upgrade

### Mechanical Pulping

Complete Lines & Systems

**Stora Enso (Kvarnsveden Mill)**  
**Borlänge, Sweden**  
PHC bleach plant for SGW

**Confidential customer**  
**Finland**  
PHC bleach plant for TMP

**Nanning Jinglang Pulp**  
**Nanning, Guangxi, China**  
P-RC™ APMP system

Key Equipment

**Jilin Chenming Paper**  
**Jilin, Jilin, China**  
HC-mixer, HC-discharge system

**Petrozavodskmash**  
**Shklov, Belarus**  
Heat recovery system  
(reboiler, engineering, cyclone and PSD)

## ► Key Equipment

Upgrades & Modernizations

**Holmen Paper (Braviken Mill)**  
**Norköpping, Sweden**  
Chip washing system 900 admtd, RT- pretreatment 800 admtd  
*TwinFlo 72 refiner*

**Norske Skog Saugbrugs**  
**Halden, Norway**  
Bleach plant upgrade for high brightness paper grades

### Panelboard

Complete Lines & Systems

**Industria de Compensados Guararapes**  
**Palmas, Brazil**  
Pressurized refining system for MDF with 384 t/d capacity

**Industria de Compensados Sudati**  
**Palmas, Brazil**  
Pressurized refining system for MDF with 384 t/d capacity

**Homanit Polska**  
**Karolino, Poland**  
Pressurized refining system for HDF (MDF) with 576 t/d capacity  
*4<sup>th</sup> order from Homanit*

**Shangqiu Dingsheng Wood Industry**  
**Shangqiu, Henan, China**  
Pressurized refining system for MDF with 312 t/d capacity

**OMO Wood**  
**Lagos, Nigeria**  
Pressurized refining system for MDF with 192 t/d capacity

**Sichuan Shengda Forestry Industry**  
**Chengdu, Sichuan, China**  
Pressurized refining system for MDF with 384 t/d capacity

**Bajaj Eco-tec Products**  
**Kundarkhi & Paliakalan, India**  
Two pressurized refining systems for MDF with 228 t/d capacity each  
*First order to Andritz in India for processing bagasse as raw material*

## ► Upgrades and Modernizations

### Fiber Preparation

Complete Lines & Systems

**Shandong Chenming Paper**  
**Shouguang, Shandong, China**  
Complete deinking line and stock preparation system

**Swedish Tissue (LPC Group)**  
**Kisa, Sweden**  
Stock preparation system for tissue machine

**ICT Poland**  
**Kostrzyn, Poland**  
Stock preparation system for tissue machine

**Lee & Man Paper**  
**Hongmei, Guangdong, China**  
OCC line for PM12 with 1,000 t/d capacity

**Phoenix Pulp & Paper**  
**Khonkaen, Thailand**  
Stock preparation system

**Confidential customer**  
**USA**  
Complete deinking line & stock preparation system (for new tissue machine)

**Shandong International Paper & Sun**  
**Coated Paperboard**  
**Yanzhou, Shandong, China**  
Complete stock preparation and approach flow system for coated board

Key Equipment

**Papierfabrik Palm**  
**Eltmann, Germany**  
Sludge dewatering system

**Abitibi Consolidated**  
**Snowflake, Arizona, USA**  
FibreFlow® drum pulper

**Georgia-Pacific**  
**Muskogee, Oklahoma, USA**  
FibreFlow® drum pulper

**Mondi Packaging South Africa**  
**Felixton, South Africa**  
FibreFlow® drum pulper, coarse screening

**Stora Enso (Kvarnsveden Mill)**  
**Borlänge, Sweden**  
Sludge dewatering system

**Asia Pulp & Paper**  
**Haikou, Hainan, China**  
Stock preparation components for 6 tissue machines

**August Krempel**  
**Kuppenheim & Zwönitz, Germany**  
Papillon™ refiners for unbleached kraft pulp  
*Repeat order, already 90 Papillon refiners sold since 2002*

**Norske Skog Saugbrugs**  
**Halden, Norway**  
HydroDrain™  
*Thickener for low-freeness broke*

**Asia Pulp & Paper**  
**Perawang, Indonesia**  
Stock preparation components for 12 tissue machines

### Tissue Machines

Complete Lines & Systems

**Hunan Hengan Living Paper Products**  
**Change City, Hunan, China**  
CrescentFormer, 5.55 m working width  
*5<sup>th</sup> order from Hengan Group*

**Swedish Tissue (LPC Group)**  
**Kisa, Sweden**  
Tissue machine, 3.37 m working width  
*First PrimePress XT shoe press*

**ICT Poland**  
**Kostrzyn, Poland**  
Tissue machine, 5.55 m working width  
*3<sup>rd</sup> order from ICT Group*

**Confidential Customer**  
**USA**  
Tissue machine, 5.5 m working width

Upgrades & Modernizations

**Toscotec**  
**Europe (confidential)**  
Yankee Dryer machining and completion

# Recent Start-ups

## ► Complete Lines

**R. Dan & Co.**  
Manila, Philippines  
Headbox

### Paper & Board Machines

Upgrades & Modernizations

**Zhangzhou Liansheng Paper**  
Zhangzhou City, Fujian, China  
3 PrimeFlow SW (single wire) headboxes,  
one with PrimeProFiler F, 6.2 m slice width  
PrimeCoat Film with air turn (film press)

### Paper Finishing

Complete Lines & Systems

**Naini Papers Limited**  
Kashipur, U.S. Nagar, India  
1 PrimeRoll S with hydraulic system

**Lee & Man Paper Manufacturing**  
Kwun Tong, Hong Kong, China  
PrimeCal Soft 1x2, PrimeCal Hard 1x2

**Ma'anshan Tianfu**  
Ma'anshan City, Anhui, China  
PrimeCal Hard 1x2

**Hebei Yongxin Paper**  
Luannan, Hebei, China  
PrimeCal Hard 1x2, PrimePress X

**Zhangzhou Liansheng Paper**  
Zhangzhou City, Fujian, China  
PrimeCal Hard 1x2

### Ventilation and Drying for Tissue and Paper/Board Machines

Key Equipment

**Georgia-Pacific Palatka**  
Palatka, Florida, USA  
High temperature hood and process air  
system

**Georgia-Pacific Ricon**  
Ricon, Georgia, USA  
High temperature hood and process air  
system

### Wood Processing

Complete Lines & Systems

**JSC Arkhangelsk Pulp and Paper Mill**  
Arkhangelsk, Russia  
Complete Woodyard  
*Start-up 11/2006, final acceptance 02/2007*

**United Fiber System**  
Ale Ale, South Kalimantan, Indonesia  
Chip Mill  
*Raw material: primarily planted acacia  
mangium; the mill's environmental  
compliance is on par with internationally  
accepted practices*

### Fiberline

Complete Lines & Systems

**CMPC Celulose**  
Nacimiento, Chile  
Complete fiberline

### Recovery

Complete Lines & Systems

**CMPC Celulose**  
Nacimiento, Chile  
Recovery boiler

**Smurfit-Stone Container**  
Florence, South Carolina, USA  
Evaporation plant

**Weyerhaeuser**  
Valliant, Oklahoma, USA  
Recovery boiler  
*High Energy Recovery Boiler (HERB)*

**Abitibi Consolidated**  
Kenogami, Québec, Canada  
TMP heat recovery system

### Chemical Systems

Complete Lines & Systems

**CMPC Celulose**  
Nacimiento, Chile  
Complete white liquor plant  
*EPC delivery*

## ► Upgrades and Modernizations

Upgrades & Modernizations

**UPM-Kymmene (Tervasaari Mill)**  
Valkeakoski, Finland  
StiroX white liquor oxidation system

Key Equipment

**Metsä-Botnia (Äänekoski Mill)**  
Äänekoski, Finland  
Green liquor clarifier

### Pulp Drying & Finishing

Upgrades & Modernizations

**SCA Graphic Sundvall AB (Östrand Mill)**  
Timrå, Sweden  
Flash dryer upgrade

**Ence (Pontevedra Mill)**  
Pontevedra, Spain  
Pulp drying plant rebuild, 3.0 m working  
width

**Indah Kiat Pulp & Paper (Perawang Mill)**  
Riau, Indonesia  
Pulp machine rebuild

### Panelboard

Complete Lines & Systems

**Fibraplac Chapas de MDF**  
Rio Grande do Sul, Brazil  
MDF pressurized refining system  
with 504 t/d capacity, chip washing system

**Sita Rohstoffwirtschaft**  
Hochheim/Main, Germany  
CVP pilot plant with 90 t/d capacity  
*New process - special raw material treatment*

**Daxinganling Luzhou Shengxing**  
Panelboard  
Harbin, Heilongjiang, China  
MDF pressurized refining system  
with 312 t/d capacity  
*Repeat order*

**Taishan Weilibang Wood Industry**  
Taishan, Guangdong, China  
Two MDF pressurized refining systems  
with 312 t/d capacity each  
*4<sup>th</sup> order*

**Shandong He You Group**  
Yu Cheng, Shandong, China  
MDF pressurized refining system  
with 624 t/d capacity  
*3<sup>rd</sup> order*

**Shandong Qixing Panel Board**  
Zouping County, Shandong, China  
MDF pressurized refining system  
with 312 t/d capacity

Upgrades & Modernizations

**Egger Holzwerkstoffe Brilon**  
Brilon, Germany  
Plug screw feeder, ribbon feeder and refiner  
for MDF pressurized refining system (840 t/d)

### Fiber Preparation

Key Equipment

**Celhart Donaris**  
Braila, Romania  
Deflaker for virgin fiber pulp

**SCA Hygiene Products**  
Mannheim, Germany  
Refiner for virgin fiber pulp

**Hartija**  
Kocani, Macedonia  
Stock preparation components for virgin  
fiber pulp

**JTI Yelets**  
Yelets, Russia  
Refining equipment

### Paper Finishing

Complete Lines & Systems

**Cartiere Marchi**  
Toscolano, Italy  
PrimeCal Hard 1x2

**JK Paper**  
Songdah, Gujarat, India  
PrimeCal Hard 1x2

**Delkeskamp Verpackungswerke**  
Nortrup, Germany  
PrimePress X

## ► Key Equipment

**Sappi Saiccor**  
Umkomaas, South Africa  
PrimeCal Hard 1x2, PrimePress X



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