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News from the world of Andritz
Bernhard and I hope you enjoy reading this issue of FiberSpectrum. As head of the Pulp Mill Technologies sector of Andritz, I would like to direct your attention to the articles about UPM-Kymmene’s Kuusankoski mill (page 4) and Portucel’s Setubal mill (page 18). In addition, our Wood Processing group contributed to the success of Holmen Paper’s Hallstavik operations (page 14). Andritz is proud to have played a major role in these projects.

The year 2003 was a difficult one for most of the industry, including suppliers. Still, we are fortunate to have been chosen for major greenfield projects, such as the Veracel project in Brazil. We are well underway with large chemical pulping and recovery projects in Chile, Germany, and Finland. Of special note is the very successful start-up in August 2003 for a new Andritz fiberline in the USA.

Within nine days, the line reached design production, has produced on-grade pulp, and the average production has been above the design rate ever since. These are exceptional results!

We thank you for your continued confidence in our people, our technology, and our service.

Sincerely,

Bernhard Rebernik
Head of Paper Mill Technologies
bernhard.rebernik@andritz.com

Our strategy to create full-line competence within Andritz proves to be successful. For example, we sold two complete 3000 admt/d pulp drying lines in 2003 (China and Brazil) which include the recently acquired Fläkt Dryer technology. And, we now have the potential to supply complete mechanical pulping systems with Flash dryers.

In this issue, you will find articles of interest for tissue producers, such as the CCM project for Metsä Tissue (page 8). The TissueFlex™ shoe press technology is now well-proven with 10 machines in operations producing supersoft tissue quality. The most recent example is Wepa in Germany, which had an excellent start-up. TMP producers will want to read the results of Holmen Paper’s RTS™ refiner upgrade project (page 14). And, recycled fiber producers will be interested in the Andritz turnkey DIP line for Krsko in Slovenia (page 24). We continue to make investments in the service area, most recently with the acquisition of Fiedler — a major supplier of screen baskets for our industry.

We appreciate your feedback and will consider every suggestion.

Sincerely,

Markku Hänninen
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Bernhard Rebernik
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The history of Kymmene Corporation started in Kuusankoski, Finland in the year 1872. Situated on the banks of the Kymi River, the mill was well-positioned amidst water, fiber and energy resources.

Sulphate pulp production began in 1964 and the pulp mill has steadily progressed over time — from 150,000 t/a to today’s 500,000 t/a of bleached hardwood and softwood.

Today, with major modernizations to both the pulp mill and paper mill, UPM-Kymmene in Kuusankoski continues to be well-positioned as a supplier of new-generation publication papers on its five paper machines.
"We had two Ahlstrom digesters from the mid-1960's and they were running good," says Markku Laaksonen, Pulp Production Manager at Kuusankoski. "The only problem was that, due to their age, they were very badly corroded. The shells were fabricated from carbon steel. The cost of maintenance and repair was quite high."

Another factor was the paper mill's program to increase capacity, which put new demands on the pulp mill.

"The starting point for choosing the cooking process is always the same — produce high quality pulp at low costs, simply and safely," Laaksonen says. "When we got approval to purchase the new digester, we were satisfied that the Andritz single-vessel hydraulic technology would meet our goals. We thought that the Diamondback® Chip Bin and the feeding system were simple and good. We also felt we would get more yield from the Andritz system, compared to their competitors."

The new 1000 t/d Andritz digester, with Lo-Level® Feed and Lo-Solids®Cooking, was started up in September 1999 after a quick 14-month delivery time.

"Start-up of the Andritz digester was very easy," Laaksonen remembers. "We had a one-month water run before we started cooking. We ramped the temperatures up and had time to adjust the control loops, and get everything right. Chip feeding to the digester began on 5 September and that same evening, first-class pulp was being produced.

"It is a very easy digester to run," Laaksonen explains. "Availability has been 100%. We are easily getting 1100 t/d or more. We have had very few disturbances, and no scaling problems, of which we had quite a lot with the old digester."

The UPM-Kymmene Group, with sales over 10 billion euros and 36,000 employees, is one of the biggest forest industry enterprises in the world. Although UPM-Kymmene can trace its roots back to the 1870's in Finland, the current corporation was created in 1995 with the merger of Kymmene Corporation and United Paper Mills Ltd. (Repola Ltd.).

The company focuses on magazine papers, newsprint, fine and specialty papers, converting materials, and wood products. UPM-Kymmene has production in 17 countries with total papermaking capacity of 8.6 million t/a.
Downflow Lo-Solids®/EAPC Cooking

The Downflow version of Lo-Solids® Cooking extends the first cooking zone to the old extraction screens of a conventional digester. This increases the total production capacity of the digester. Before the second cooking stage there is a short counter-current displacement zone (the heart of the Lo-Solids® cooking process). As with all Lo-Solids® cooking processes, the dissolved organic substances are extracted before bulk delignification occurs, while the alkali profile is optimum. Cleaner pulp is produced, tear strength is preserved, and bleaching is done more efficiently since the dissolved organics are eliminated.

As the cooking time is longer, and even though the alkali concentrations are lower with Downflow, cooking temperatures can be much lower compared to conventional cooking. The combination increases pulp strength.

Enhanced Alkali Profile Cooking (EAPC) can be used when maximum tear strength is needed. EAPC raises the alkali charge and the alkali concentration in the cooking stage so that residual alkali from the lower extraction is high. This further reduces the cooking temperature. This alkali-rich black liquor is recycled to the impregnation zone and consumed there. With a combination of Downflow Lo-Solids® and EAPC, it is easy to optimize the effective alkali profile — giving the operator the ability to select for pulp yield, pulp strength, and bleachability.

"The Diamondback® Chip Bin and the feeding system are simple and good," according to Laaksonen.
Today, the line produces 300,000 t/a of bleached hardwood pulp. Pulp properties are good. Kappa 18 is easily reached at a high viscosity around 1400 mg/ml. Total rejects have averaged 0.8% and wood consumption is down 3%. The pulp bleaches to its target 91 ISO using less ECF bleaching chemicals than before.

Downflow Lo-Solids® retrofit for softwood line

Kuusankoski’s old softwood digester, supplied by Ahlstrom in the 1970’s, was running vapor-phase technology with a black liquor impregnation tower. Over the years, corrosion took its toll. A corroded impregnation tower was replaced in 1993.

“This digester has always experienced hanging problems on pine, due to its height and narrow diameter,” Laaksonen confides. “Plus, we had some pulp strength problems in the past which caused us to buy pulp from the outside.”

UPM-Kymmene chose to rebuild, rather than replace, the softwood digester in 2000 and again selected Andritz. This time, the decision was made to rebuild the two-vessel vapor-phase digester with a combination of Downflow Lo-Solids® and Enhanced Alkali Profile Cooking (EAPC) to improve pulp strength and yield.

Current pulp production for the softwood line is 200,000 t/a bleached. The kappa target is 30 and the brightness target is 87 ISO.

The newly rebuilt softwood digester started up in January 2001. Since that time, the mill has run extensive strength tests on the softwood pulp. Remarkably, strength delivery in the blowline has gone from 84.7% before the rebuild to 90.9% with Downflow Lo-Solids® Cooking.

“The quality of the pulp is good and homogeneous,” Laaksonen says. “We chose the Andritz technology to get more strength in the pulp and we have achieved this. All our paper machines now use the pulp from our own line and we have stopped purchasing softwood pulp from the outside.”

Since the initial rebuild, Andritz has further refined the digester to increase capacity and runnability of Kuusankoski’s softwood line.

A new screen zone was installed during summer shutdown (2003) that decreased the alkali charge, lowered the cooking temperature, and further increased pulp strength.

“The digester is running very stably and pulp strength has increased,” says Laaksonen. “Our aim is to get more production with stable quality out of this digester. The demand is there.”

Find out more at www.fiberspectrum.ahlstrom.com

The modern fiberline control room for wood processing, hardwood pulp and softwood pulp lines at Kuusankoski. Esa Vanhalakka is the operator in the foreground, and Niko Saarinen is in the background.
Metsä Tissue's two mills in the Småland area of Sweden have been quietly at the forefront in two new and extremely interesting developments in the tissue industry: the Compact Concept Mill and the TissueFlex™ press. Andritz played a key role in both.

Roland Leidefors, Machine Operator, at the wet end of the Andritz CrescentFormer machine (PM 5) at Metsä Tissue’s Nyboholm mill. Metsä’s Compact Concept Mill focuses on investment efficiency and production efficiency. “The operator’s goal is to maximize quality and efficiency of final output, not just build parent rolls as fast as possible.”

* Trademark of Voith, cooperation partner of Andritz in the field of tissue
Clear focus on markets and profits

Metsä Tissue is a recognized innovator in the European tissue business. With an annual capacity of 450,000 tonnes, it is number six in world rankings. Metsä Tissue production units are located in Sweden, Finland, Germany, and Poland. The company has a clear strategy focusing specifically on market sectors where it can achieve respectable market position.

Metsä Tissue, formerly known as Metsä Serla, has nine mills, with three located in Sweden. Beginning in 2004, the Metsäliitto Group became the principal owner of Metsä Tissue (66% share). This ownership restructuring supports Metsä Tissue’s activities to further develop its business to become the world’s top supplier of Tissue and Baking & Cooking products.

Jarkko Kaplin is the Supply Team Manager for Metsä Tissue in Sweden. In this role, Kaplin is responsible for production at the company’s three Swedish mills. The Mariestad mill has a capacity of around 75,000 t/a of both consumer and away-from-home grades. The Nyboholm and Pauliström mills, located within 8 km of each other in the Småland region, have a total capacity of 45,000 t/a of converted products. The majority of this tonnage goes into consumer grades.

Comfort, and quality, for every day

Kaplin explains some of the company background and strategy: "Metsä Tissue is a very focused company, with Europe as our main market area. Turnover was around 659 million euros in 2002 and about 55% of our production went to continental Europe, 35% to the Nordic countries, and 10% to other markets. We are strongest in the Nordic countries where we have approximately 45% market share, depending on the grade. Of course, when you have a high market share, it is a tough fight to keep this level, but we have been able to maintain it based on factors such as quality, service, and delivery times — a function of our localness so to say. Quality is clearly a very important factor for us."

Indeed, the push to increase quality was the driving force for two recent investments in the Nyboholm and Pauliström units, which are collectively referred to within Metsä Tissue as "the Småland mills." During the period 1999-2000, the Småland mills underwent major investments.

Following these and later investments in converting technology, says Kaplin, the Småland mills are presently the "most complete invested operations in the company, and also produce the best quality."
Pioneering a new concept

In 1999, Metsä Tissue introduced a new concept — the Compact Concept Mill or CCM — for tissue production focused on optimizing investment efficiency and production efficiency. The idea of CCM is to get better profitability by locating the papermaking and converting operations into one seamless process. In other words, CCM blurs the traditional boundaries between the paper and converting sides. “The boundaries, including employee workflows and attitudes, have disappeared,” Kaplin says.

This new concept, combined with a very steady paper machine production rate, leads to higher overall production efficiency from the total assets. “The layout and employee attitude is such,” says Jan Eklund, Technical Manager for the Småland mills, “that the machine operator keeps a close eye on the progress in converting. The operator’s goal is to maximize the quality and efficiency of our final output, not just building parent rolls as fast as possible.”

Eklund explains some of the background: “Back in 1997 we were looking at alternatives for our future growth. We wanted a concept that was sized right for our market, where we already have a large share. We needed something that gave us premium quality, investment efficiency, and production efficiency in a small package at a good price. Therefore, we came up with the Compact Concept Mill Project.

“To be honest, I was hesitant at first when it was suggested that we build a paper machine designed for 1000 m/min and not higher. Papermakers always want something bigger and faster than what anyone else has. It is also natural in this industry to build a machine designed for one speed but then to...
slowly move up the speed curve. But eventually, I was convinced that if we had the discipline to design, build, and pay for only the specific functions we needed, we could get a more rapid payback from running the mill at steady output.”

Working closely with a consultant, Metsä Tissue started to define the concept in more detail. Nyboholm was chosen for this concept, says Eklund, based on the special mentality and enthusiasm that is present in the labor force.

As the project developed and suppliers were chosen, an efficiency task force team was formed. This included all of the suppliers to the project. This team met regularly to make sure that all the participants in the project were communicating and moving in the same direction with the efficiency and quality targets clearly in focus.

Small is beautiful, and efficient

Metsä Tissue decided from the start that it did not want to have the world’s fastest or biggest line. Using “small can be beautiful” thinking, the design team decided to keep the line simple. To keep costs down, the line would include one paper machine, one converting line, one wrapper/bundler, and one palletizer. In this single-line scenario, selection of the individual machines was critical to the success of the CCM.

The Andritz tissue machine was designed to run at about 1000 m/min. The theory was that, for this mill, the 1000 m/min speed would deliver better overall efficiency than would a higher speed machine.

Another interesting feature is the physical layout of the line. “As part of this focus on simplicity and efficiency, we also wanted to emphasize the teamwork aspect. So we gave thought to devising ways to integrate the line so there are virtually no visible boundaries between the papermaking and converting operations,” Eklund says.

From the control room, the operators can see almost the entire process from the paper machine headbox through to finished product on pallets going out to the loading bay. This, says Eklund, gives the shift personnel more incentive to work together to keep the entire line running well rather than focusing on just one unit. By laying the line out in this manner, the paper machine operator has a secondary responsibility to help the converting operators, which is something that is almost unheard of in the traditional mill where there are physical boundaries, and often long distances, between the papermaking and converting operations.

Here’s a quick test for you:

Which company is Scandinavia’s largest importer and distributor of plush animal toys?
(Hint...it’s not Toys ‘R’ Us).

Actually, somewhat surprisingly, it is Metsä Tissue! The company gives away soft lambs (Lambi brand) as part of its brand promotion campaign. Over one million super-soft lambs are given to loyal buyers of Lambi tissue products. Metsä Tissue has built the Lambi brand up to be the leading premium tissue product: bathroom tissue, household towels, all-round towels, and handkerchiefs.

As further indication of its success, Lambi was recently named the best tissue product in Sweden in a survey done by the Dagens Nyheter, the country’s largest daily newspaper.
Smooth start-up for the line

PM 5 is a CrescentFormer machine from Andritz. The company chose Andritz after talking with all of the tissue machine suppliers. Says Eklund, “Andritz was willing to work with us on this concept, which wasn’t exactly an off-the-shelf solution. They listened and gave us what we wanted. “Essentially, everything that Andritz was responsible for, including stock preparation and PM 5, started well,” Eklund says. “After start-up, the Andritz machine ran for 13 hours without a break. It started so well that initially the converting line could not keep up. But, we soon got everything into balance.”

The bottom line is that all this emphasis on simplification of the machinery and systems led to very significant savings in the purchase price of the equipment. “The key thing is that we were looking at efficiency of the whole line over a longer period.” Eklund says. “It doesn’t make much sense to have a paper machine that can run very fast some of the time, but doesn’t keep pace all the time. Or, one that runs too fast for the converting lines.”

Quality was clearly the number one priority with the TissueFlex™ project at Pauliström. Bulk increased 13-22% and there have been important improvements in absorption, uniformity, and handfeel.

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Pauliström gets TissueFlex™ press for bulk

Following the CCM project, and in keeping with the emphasis that Metsä Tissue has on quality, the company added a TissueFlex™ shoe press on its PM 6 at the Pauliström mill in April 2000. This was among the first installations in the world of this tissue pressing concept. The TissueFlex™ version was developed based upon the extensive experience Voith (Andritz’s cooperation partner for tissue machines) had with shoe presses for other paper grades. The principle of TissueFlex™ is to spread the press impulse out over a larger area to help retain bulk in the sheet.
Quality was clearly the number one priority with the TissueFlex™ project at Pauliström and it is clear that quality has improved. After the new press was installed, testing by Metsä Tissue showed that bulk had risen between 13 and 22%, with the largest increase coming on the lower-weight toilet grades. In addition, the mill has also seen important improvements in absorption properties of the sheet, as well as uniformity and handfeel.

Prior to the installation of the TissueFlex™, the 2.7 m wide PM 6 had two presses against the Yankee dryer. In the rebuild, the presses were replaced with the TissueFlex™ press roll against the Yankee. As was expected, after-press dryness is clearly lower now, compared to the time when the machine had two presses.

Eklund says that the TissueFlex™ has been a big asset for developing new Lambi (see sidebar page 11) qualities.

Getting value for money

Overall, it is clear that Metsä Tissue made good investments in Småland by carefully targeting new technology to produce quality that consumers are willing to pay for. It has also been cautious about not buying more technology than it really needs. In this manner, Andritz is a key partner in providing exactly the right solutions to help Metsä Tissue meet these goals.

The people from the Småland region of Sweden are famous for being very careful with their money and resources. These investments in the Småland mills are an excellent example of how small and simple can often be the most profitable strategy.

In the middle of the 18th century, German immigrants established the province of Småland as the home of the Swedish glass-making industry.

A very large province in Sweden, Småland also is home to vast forests and pleasant lakes. This region has many coastal towns that stretch along the Baltic. The Mörrumsån River is noted for salmon and sea trout and Lake Vättern for char fishing.

Three-quarters of the Swedish glassworks are found in the counties of Kronoberg and Kalmar. The glassworks, where craftsmen can still be observed hand-blowing glass, are open to visitors. Visitors may also be invited to a hyttssill — a traditional evening of entertainment including food of fried herring, sausages and potatoes baked around the glass furnace, served with beer and schnapps.
Holmen Paper’s Hallsta mill in Hallstavik, Sweden started newsprint production in 1915 and has now developed into one of the world’s largest and most modern production facilities for high quality wood-containing printing papers. Annual paper production capacity at the mill has risen to nearly 800,000 tonnes.

During the past 20 years, Hallsta has placed increasing emphasis on moving up the value ladder. It has progressively been making more improved newsprint, SC, and other specialty printing papers, while at the same time phasing out production of bulk grades.

As part of its multi-year, multi-million Euro upgrading process, Hallsta recently modernized numerous parts of the mill to get better quality, output, and environmental efficiency. The centerpiece of the latest round of investments was the enormous PM 11 which started up in April 2002. This new machine, at 8.6 m trim width and capacity of 330,000 t/a, is focused on MF magazine papers and improved newsprint. It replaced an older, smaller machine and created an increased demand for pulp on the order of 110,000 t/a.

To feed PM 11 and to meet the increased pulp quality requirements, major investments were made in the woodyard, TMP lines, and bleaching areas of the mill. Andritz played a key role at Hallsta by supplying major pieces of equipment in each of these areas for the modernizations.

Andritz has worked very closely with Holmen Paper to get more output from their TMP 3 line through the addition of two RTS™ refiners. The results have been excellent — energy savings of more than 300 kWh/tonne and improved quality. At the same time, the refiners gave a major boost in the line’s production capacity.
Wood sorting for natural brightness

In 1999, Andritz supplied a new wood processing line to replace two older lines, which were scrapped. The new Andritz line has a capacity of 3,300 m$^3$ per day and consists of a log infeed system, debarking drum, and chipper.

The mill's woodyard plays a key role in the drive for both product quality and environmental protection. Here, spruce logs are sorted as they come into the mill based on the annual growth rings in the wood. In a method that Holmen helped create in the mid-1990's, this rough sorting is used to separate the wood into three categories. The fastest growing logs, with the highest annual growth increments, are used for the highest brightness pulp.

In this manner, says Lennart Karlsson, Process Engineer at Hallsta, the mill saves on bleaching chemicals and reduces the environmental load. "As we moved to improved grades with higher brightness requirements, it seemed logical to attempt to use the natural brightness of the wood," Karlsson says. "So the brightest chips are used for the highest qualities, therefore saving bleaching chemicals and, of course, money."

Lennart Karlsson, Process Engineer.
"We are very satisfied with the installation."

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TMP upgrade feeds PM 11

There are a total of four PMs being fed by four pulp lines. Three lines run TMP, and the oldest line, from the early 1960’s, runs stone groundwood.

Hallsta tries to focus its pulp lines so that, essentially, one line feeds one paper machine. TMP 3 is the one dedicated to PM 11. When the paper machine is running full speed (1850 m/min), it consumes around 1,050 t/d of pulp. Before the rebuild, TMP 3 was only capable of making 700 tonnes per day. Clearly, something had to be done to increase capacity.

Energy savings from RTS™ refiners

Hallsta’s TMP 3 is composed of four parallel lines, each made up of one primary and one secondary refiner. The equipment, before the Andritz rebuild, was composed of old Jylhä refiners from the late 1980’s. In the end, the mill decided to install two new Andritz RTS™ refiners in the primary positions on two of the lines.

“We were guaranteed savings of at least 300 kWh/tonne and that adds up to a lot of money over the year.” An Andritz RTS™ refiner (model S 3068) connected to a 17 MW motor operating at 2300 rpm.

Faced with this need to produce more pulp, Pulp Mill Manager Mikael Wahlgren and his team looked at several alternatives for adding pulp capacity to TMP 3. With energy costs rising in Sweden, Wahlgren was also highly motivated to reduce specific energy costs for the TMP. Andritz worked closely with Hallsta to explore alternatives for modernizing TMP 3.

The Andritz S 3068 refiner, with design capacity of 285 t/d was operating at 350 t/d less than a year after start-up.
“We were guaranteed savings of at least 300 kWh/tonne and that adds up to a lot of money over the year. The RTSTM was also a good solution because the refiners are rather compact. Since TMP 3 is tightly packed into the building, saving space was an added advantage,” Wahlgren said.

The RTSTM concept is an Andritz development which adds a new dimension to the conventional TMP process — refiner speed. The refiner plates turn at around 2300 rpm, versus 1500 rpm for normal refiners. RTSTM raises the preheating temperature at a controlled retention time to prevent lignin from coating the fibers. Pulp quality is improved and the specific energy per ton of pulp produced is significantly reduced.

So far, says Wahlgren, the RTSTM refiners have worked very well, with energy consumption well below the previous levels and the pulp quality is excellent. “We are saving 300 or more kWh per tonne and the pulp properties are as good or better than with the old refiners. Light scattering, for example, is even better with the new RTSTM refiners,” he said.

**Savings higher than expected**

Karlsson, the Process Engineer responsible for the TMP 3 line, was very involved in the installation, start-up, and continuing optimization of the RTSTM refiners. “We are very satisfied with the installation,” says Karlsson. “It has fulfilled all of the goals as far as quality is concerned and we are saving more energy than Andritz guaranteed.

We had been looking for 300 kWh/tonne and are sometimes getting 350 or even more. We are using around 1,600 kWh, although this varies depending on the wood quality.”

**Trials to test capacity**

Capacity and throughput on the new line have also been very good, with the mill continuing to run trials to see just how much pulp the RTSTM units are capable of making. Micael Axelfelt, Northern European Sales Manager for Andritz, works closely with the mill on these capacity trials. In fact, he has been working very closely with the Hallsta team for more than 20 years, as he was a process engineer at the mill before joining Andritz.

The idea, says Axelfelt, is to put as much of the tonnage as possible through the low-energy RTSTM units, to gain both energy savings as well as improved pulp quality. In June 2003, the mill succeeded in producing 15 t/h — the equivalent of 360 t/d — during trials on the RTSTM line. The capacity of TMP 3 is now about 900 tonnes per day, with the disk filter being the bottleneck in the system.

All in all, the Hallsta team is very pleased with their choice of the Andritz RTSTM solution. With high quality pulp, produced at lower energy costs, feeding a new paper machine, it looks like Hallsta will remain a top player in the mechanical printing paper markets for a long time to come.

Find out more at www.fiberspectrum.andritz.com
ASIP - Assistência e Serviços para a Indústria do Papel, ACE, a special-purpose corporation owned by Andritz, Siemens, ATM, and Portucel, is responsible for the millwide maintenance at Portucel’s Setubal mill in Portugal.

This is part of Andritz’s service concept called Overall Production Efficiency (OPE®) where the goal is to increase the production of a process line, or entire mill, by leveraging the overall maintenance activities.

In the case of Setubal, the goal was not just to reduce maintenance costs, according to Henrique Figueira, Pulp and Energy Production Manager. “Our first priority was to increase the availability of the installed equipment, through better maintenance approaches and state-of-the-art procedures. We are not interested in saving money if, for instance, the availability of the equipment decreases. We want to keep availability at a high level, at the minimum cost.”

Seppo Sandberg, Site Manager for ASIP and also an Andritz employee, supports the logic to this approach.

“Maintenance cost per tonne of pulp is a key performance indicator,” Sandberg explains. “Each month we report on the total maintenance cost per tonne of pulp produced. ASIP’s compensation is based upon achieving key performance criteria (production, quality, raw material consumption, safety, etc.) for each process area and overall.

“As the Site Manager, I have two simple targets. The first is customer satisfaction. Without customer satisfaction, the second target is not achievable. The second target is a positive financial result for my company.”

The drive for more production

Figueira says that the short-term goal is not only to significantly reduce maintenance costs, but to increase production for the same level of maintenance spending. This will reduce maintenance cost/tonne. The benchmark cost before ASIP began was 35 euros per tonne. Today’s target is 27 euros per tonne. “The drive is for more production at a higher equipment availability,” Figueira says.

“Our first attempt at outsourcing local maintenance began about eight years ago in the woodyard area,” Figueira says. “We also did this for the effluent treatment plant, but only small local companies were involved at that time.”

Left: Henrique Figueira, Pulp and Energy Production Manager for Setubal.

“We want to keep equipment availability at a high level, at the minimum cost.”

Right: Seppo Sandberg (right), Site Manager for Andritz’s OPE® team at Setubal, confers with a pulp production supervisor in front of the continuous digester.
The first major outsourcing contract Portucel made was for the Power area. They put the Power and Woodyard areas together in one contract a couple of years ago and first selected another supplier to do the maintenance. Then the mill awarded a Fiberline maintenance contract to ASIP at the end of 2001.

"In March 2003, we made the decision to consolidate all the local maintenance for the whole pulp mill into one contract with ASIP, as we were satisfied with what had been done in the Fiberline area since January 2002," Figueira says. Pulp production of the mill is now 480,000 t/a.

"We needed a good, dedicated team with engineering backup," he continues. "That’s why we selected ASIP. They have the knowledge, the procedures, and the team to achieve the goals we have placed on ourselves."
Outsourcing — more than "labor brokers"

Portucel has had a good relationship with Andritz for years and was open to discussions about new ways of doing maintenance at a time when Andritz was developing its OPE® service concept. “The OPE® concept here at Setubal is based upon using our process expertise, our equipment knowledge, maintenance expertise from ourselves and Siemens, and the expertise available at the Setubal mill to form a partnership,” says Risto Hämäläinen, head of Pulp Mill Services for Andritz. “This is not simply labor outsourcing. We’re adding as much value to the production side as the maintenance side.”

“ASIP has very professional people at our mill,” Figueira says. “Process and equipment experts from Andritz and Siemens, their very best specialists from Austria, Finland, and the USA visited the mill to evaluate production performance and conduct higher level process and technical studies in the fiberline, screening, recovery, and pulp drying areas.”

“This is one of the added values we bring to the customer — our process expertise,” Hämäläinen adds. “This was part of our initial proposal to Portucel in order to distinguish OPE® from a conventional maintenance service. All of our work, including the special studies, is designed to help Portucel get better and more production out of this mill.”

“Much of the main production equipment we have here is from Ahlstrom Machinery, which is now a part of Andritz,” Figueira says. “But, even if it weren’t Andritz equipment, I don’t think there would be any risk in getting Andritz involved in an OPE program, due to the fact that they have their background in process design, engineering, equipment design, and manufacturing of the equipment used here.”

“We are working with a very enlightened management at this mill and they understand the role of maintenance in reducing the overall cost of a produced tonne of pulp,” Sandberg says.

The ASIP organization

ASIP consists of about 150 people and includes people who used to work directly for Portucel.

For strategic reasons, Portucel continues to staff the workshop and engineering functions inside Portucel. The workshops include the facilities inside the mill and also some special shops on the outside. Engineering is responsible for analyzing process equipment, supporting capital investments, and planning for the annual shutdown. Portucel also maintains the spare parts stores.

“Our first and most important responsibility is the daily maintenance of the mill,” Sandberg explains. "As a part of this, we perform predictive maintenance on equipment as we build the historical database about equipment performance. When we began working here, we had no historical data to work from.”
ASIP commits about 10 people in the organization to various "engineering" functions such as making improvement studies, investigating equipment failures and compiling fault reports.

Any shutdown longer than four hours is analyzed in a Fault Report. Engineering personnel analyze what happened, what steps were taken, and propose corrective actions. The proposal indicates what resources (ASIP, Portucel, third party, etc.) are required to correct the problem.

The goal is to provide higher availability of the equipment at the same (or less) cost/tonne than Portucel had done previously.

"Even though we wear different uniforms, in the daily maintenance work there is no difference between Portucel and ASIP people," Sandberg says. "We work together very well. Perhaps one advantage for the employee working for ASIP is the training we provide. Portucel even pays a percentage of the costs so their own people can participate in our training to keep updated on current maintenance procedures."

"I think it is a real challenge for ASIP to take people who used to work for Portucel and organize those persons to handle all the requests for maintenance that the mill generates," Figueira says. "Having the right skills in the right place at the right time is not easy."

Millwide results

"We have monthly reports about the availability of each process area on a daily basis (time stops) and production losses in comparison with maximum sustainable production throughput," Figueira says.

Figures show that equipment availability is in general improved, together with an increase in mill Capacity Efficiency (CE).

"Provided that the current performance can be sustained, or even improved in the near future at a reasonable cost," Figueira says, "I can foresee this partnership has the possibility to be developed over a longer time."

At the end of the current three-year contract, Portucel and ASIP will sit down to evaluate the overall activities and see if all partners have the common interest to renew the contract period. "There is still a lot that can be done," Figueira says.

Find out more at www.fiberspectrum.andritz.com
Portucel

Portucel Soporcel Group, with a turnover of 1,085 million euros in 2002, holds a leading competitive position among European producers. It operates three mills in Portugal: Setubal, Figueira da Foz, and Cacia. The Group sold 606,000 tonnes of pulp and 905,000 tonnes of paper in 2002. Portucel has developed the capability to utilize more eucalyptus in uncoated woodfree sheets.

Today, with only a small amount of long fiber in the mix, Portucel produces very good quality office papers — its “Navigator” and “Discovery” brands are among the leaders in Europe for brand equity and brand quality.
The Setubal Mill started up in 1964. First, batch digesters were utilized to produce about 100,000 t/a of bleached and unbleached eucalyptus and Portuguese pine pulps.

In 1979, a complete pulp line with a continuous digester was added and production increased to 260,000 t/a of fully bleached eucalyptus. In 1989, a major modernization occurred, both for quality and environmental reasons. This included a new continuous digester, a new recovery boiler, and the closure of the 1964 pulping line. The mill is located in the heart of some natural preserve areas, so environmental issues are very important.

Since 1995, the mill has been de-bottlenecked and fine-tuning operations were implemented (e.g. increased evaporation capacity, modifying one digester to expand the cooking zone, etc.). Total output of the pulp mill is now 480,000 t/a.
Shortly after the formation of its Fiber Preparation Division, Andritz was awarded its first turnkey Deinked Pulp (DIP) line order by Vipap Videm Krsko Proizvodnja Papirja in Celuloze d.d., Krsko, Slovenia.

To say that Danijel Ostir and his team at Vipap Videm Krsko, Slovenia were in a sticky situation in 1998 is an understatement.

As Head of Technology and Development for this southeastern European producer of newsprint and packaging grades, Ostir knew the mill's survival was at stake. Externally, the company had to endure Yugoslavia's civil war and a downward spiral for paper pricing. Internally, the mill's quality and environmental issues were, in Ostir's words, "close to a catastrophe."

In rapid succession, Vipap Videm Krsko lost many customers who had purchased products for more than 20 years. The company was also facing fines in the millions of euros because of high COD/BOD emissions into the Sava River from their chemical pulp mill. The mill did not have the investment capital to modernize this antiquated pulping facility (bought secondhand in the 1970's) or rebuild their paper machines. Two small deinking units they had recently installed were overwhelmed by stickies, resulting from high amounts of glues and plastic wrap in the wastepaper furnish.

To add to the turmoil, the ownership changed, not once but twice, in 1998. The original owner, ICEC, a Czech private company, was bought by the IPB bank of the Czech Republic, which then sold the mill to CSOB, another Czech bank.
Moving toward a new beginning

Going back to the days of the original owners, Ostir and his team analyzed and prepared over 40 options for a path forward. All of this was happening in the context of “consistently poor quality” production and countless hours trying to placate customers who were threatening to throw Vipap Videm Krsko out for good.

With a grin today, Ostir can speak of these times as having a good side. "We were fighting for our lives," he says, "but we believed we could get through the mess."

But which was the right path forward? Says Ostir, "Basically, we proposed to move from wood-free to wood-containing newsprint, and still produce some graphic paper. We knew that whatever we produced, it would have to be constant quality and a competitive product."

In contrast, the mill’s original owners envisioned production of a wide range of newsprint and graphic paper grades. Fortunately for Ostir and other Vipap Videm Krsko managers, IPB, and then CSOB, supported the plan they believed would serve customers, shareholders, and employees best. They put the central focus on newsprint and improved newsprint, increasing DIP and groundwood pulp production to a level that would replace chemical pulp completely.

This would offer management options for raw material ratios and launch an approach to raise environmental standards even higher in some parameters than those of the European Union (of which Slovenia will become a member on May 1, 2004). They could also close the chemical pulp facility without losing any core customers.

Their pursuits are paying off. Since the fall of 2003, they have had a new deinking plant with a capacity of 160,000 t/a, and a rebuilt thermal groundwood (TGW) plant of 50,000 t/a about to come on-stream. In addition, two paper machines have been rebuilt to boost quality of news and improved news, including installation of quality control and distributed control systems.

Best of all — Vipap Videm Krsko has seen the return of old customers, and orders from completely new customers. Says Ostir, “The days of paying high fines because of pollution are over. That crippled our ability to make a profit. The new DIP line and, soon, our rebuilt TGW plant give us a fresh start. The original catastrophe for shareholders, employees, and the community is on the verge of being a big success. If there were a trophy for overcoming catastrophe, we should win it.”
Turnkey DIP from Andritz

Andritz’s contribution to the Vipap Videm Krsko success is higher quality pulp, produced by the turnkey 400 t/d DIP line. The line started up in June 2003. Andritz gives the mill the flexibility to achieve higher brightness with online bleaching. All design, engineering, equipment, instrumentation, tanks, chests, pipework/erection, start-up supervision — even assistance securing financing — came from Andritz.

Today, the headaches of stickies are gone, as the DIP line helps Vipap Videm Krsko consistently make standard and improved newsprint, using ONP, OMG, and Mixed Office Waste as furnish.

According to Christian Pedratscher, Senior Vice President & Divisional Manager for Fiber Preparation Systems with Andritz, “Vipap Videm Krsko now has the opportunity to purchase less expensive wastepaper, but run smoothly, and satisfy their customers.”

Pedratscher points out that Andritz has been in the recycled fiber preparation business for decades, but never like today. “Vipap Videm Krsko represents the official beginning of our role as a complete solutions supplier, combining the capabilities of the former Ahlstrom Machinery Corporation and Andritz, where we intend to grow our market share. Our turnkey offering positions us to win other orders where mills seek to maximize the value of wastepaper and lower costs.”

Evident at Vipap Videm Krsko are Andritz’s recent developments, notably the SelectaFlot™ pre-/post-flotation cells, and the CompaDis™ dispersion system, which contribute to the quality of Vipap Videm Krsko’s complete line. In addition, the DIP plant includes the proven FibreFlow® Drum pulper, coarse and fine screens, thickening with screw presses and disc filters, cleaner plants, HC peroxide and MC dithionite post-bleaching, and the internal water treatment system.

The FibreFlow® Drum has a 3.5 m inner diameter and a design capacity of 560 admt/d. The Drum produces strong, clean pulp continuously, and eliminates the need for separate de-trashing equipment. The gentle pulping process produces high yields with minimal fiber damage.

Following the Drum are three stages of coarse screening with ModuScreen C6R and C4R units. Hole size for the screens is Ø 2.0 mm. The first SelectaFlot™ unit, consisting of five primary and two secondary cells is then used for pre-flotation. The patented Multi-Injector inside the SelectaFlot™ cell creates optimal bubble size for maximum dirt speck removal and optimum brightness. The energy consumption is also about 20% less than comparable cells, according to Pedratscher.

Following pre-flotation, four stages of AhlCleaner TC 133 cleaners are employed. Fine screening is accomplished in a single ModuScreen HB7R unit, slot size 0.15 mm, and thickening is accomplished with an Andritz Disc Filter and Screw Press.

After thickening, the CompaDis™ disperger combines heating and feeding in one advanced unit. The technology...
was based on Andritz's long experience with HC refiners. Compared with other dispergers, the design minimizes space requirements. A second SelectaFlot™ unit, consisting of four primary and two secondary cells, follows the disperger in a post-flotation capacity. After thickening in another Disc Filter, the pulp is sent to storage (for standard news) or MC Dithionite bleaching (for improved news). Final brightness of improved newsprint is about 65 ISO.

The irony of trouble starting with customers

The challenge of any deinking system is to deal with problematic furnish. The irony of the contaminant problem is that the mill's customers (printers) are often the culprits in causing problems in the mill's production. As printers use more and more glue for binding, including hot melt techniques, wastepaper is laden with materials that tend to agglomerate into stickies — producing breaks, holes, and many complaints when the paper hits a printing press.

The deinking system from Andritz has delivered a knockout punch to this problem. The other culprit, metal objects from wire to staples, is also eliminated early.

Says Pedratscher, "Taking out all the heavy contaminants in the beginning is essential so that they don't have a chance to transfer problems throughout the process."

Even rejects now serve a useful purpose, combining with bark to become energy in the mill's new biomass boiler. The deinked waste rejects, including ash and fibers embedded in the ink, go to sludge dewatering, are pressed to 65% dry content, then are fed into the biomass burner.

Thumbs up at the paper machine

According to Dragan Kranjc, Production Manager for PM 1 & 2, the new deinked pulp system and a rebuild of the wet end are producing positive results.

"Papermaking results are much better," Kranjc says. "We see fewer particles in the sheet. Now we have fewer breaks because of the new deinking system, and rebuilding of the top wire, a new press section, and dryer section."

Looking to the future

Vipap Videm Krsko is well-positioned with options to produce quality paper on a consistent basis, meet or exceed environmental levels of the European Union, and have the flexibility to adjust the ratio of deinked to groundwood, based on cost and desired properties in the sheet.

What's ahead? Says Ostir, "Optimization, finding ways to make inferior waste perform at high levels, and certainly no catastrophes!"
**Wood Processing**

**Complete Lines & Systems**

- **Weyerhaeuser**
  - Valiant, OK, USA
  - Woodyard
  - *Duplicate of Weyerhaeuser, New Bern, NC project in 2002*

- **Sappi**
  - Cloquet, MN, USA
  - HHQ-Chipper
  - *First horizontal fed HHQ-Chipper in North America*

- **Henan Puyang Longfeng**
  - Puyang City, Henan Province, China
  - Woodroom equipment for APMP

- **Jiangxi Chenming Paper**
  - Nanchang, Jiangxi Province, China
  - Woodyard

- **Jiangsu Dare Wood**
  - Henan Province, China
  - Woodroom equipment for MDF

- **Confidential Customer**
  - Hainan Province, China
  - Woodyard containing four chipping lines

- **Guangdong Weihua**
  - Meizhou City, Guangdong Province, China
  - Woodroom equipment for MDF

- **Grant Forest**
  - Englehart, Ontario, Canada
  - Rotary Debarker Line
  - *Sister mill to Timmins, our first RotaBarker™ installation*

**Key Equipment**

- **Brabant Van Opstal**
  - Breda, Netherlands
  - PowerScrew™ reclaimers

- **Interstate Paper**
  - Riceboro, Georgia, USA
  - Stacker-Reclaimer

- **Soporcel**
  - Figueira da Foz, Portugal
  - Chip screening with CS800 Screen

**Upgrades & Modernizations**

- **Mondi Kraft**
  - Richards Bay, South Africa
  - Chip screening with two CS800 Screens

- **Metsä-Botnia**
  - Kaskimaa, Finland
  - DrumMatrix™ Control System

- **Iggesund Paperboard**
  - Workington, United Kingdom
  - Chip handling

**Chemical Pulping**

**Complete Lines & Systems**

- **Veracel Celulose**
  - Eunapolis, Brazil
  - Complete Fiberline
  - White Liquor Plant
  - *Biggest single-line capacity in the world*

- **P.T. Riau Andalan P&P**
  - Kerinci, Indonesia
  - Cooking & DD-Washing System for Pin Chips and Fines

- **UPM-Kymmene Viasforest**
  - Pietarsaari, Finland
  - Cooking & DD-Washing System for Sawdust

**Key Equipment**

- **Oji Paper**
  - Tomioka, Japan
  - X-Filter™

- **Metsä-Botnia**
  - Kemi, Finland
  - Stirox™ White Liquor Oxidation

- **Glatfelter Company**
  - Spring Grove, PA, USA
  - LC Ozone Bleaching System
  - *First commercial application of LC ozone bleaching outside of Asia*

- **Confidential Customer**
  - Southeast USA
  - V-Max™ Drum Washer, DD Washer, MC® Pump Systems
  - 5-stage washing system

- **Weyerhaeuser Canada**
  - Kamloops, BC, Canada
  - Replacement M&D Digester System

- **Kimberly Clark**
  - Terrace Bay, Ontario, Canada
  - Two-Stage Bleaching System

- **Shandong Tralin Paper**
  - Gaotang, Shandong Province, China
  - Coarse and Fine Screens for Multiple Fiberlines

- **Confidential Customer**
  - Hainan Province, China
  - Screening Components for new Fiberline

**Upgrades & Modernizations**

- **CENIBRA - Celulose Nipo-Brasileira**
  - Fonseca, Brazil
  - Lime Kiln

- **Suzano de Papel e Celulose**
  - Suzano, Sao Paulo, Brazil
  - Lime Kiln

**Sheet Drying & Baling**

**Complete Lines & Systems**

- **Confidential Customer**
  - Hainan Province, China
  - Sheet Drying Line 9.3 m
  - *Biggest single line Pulp Drying Plant in the world (3230 t/d) when starting up*

- **Stora Enso North America**
  - Wisconsin Rapids, WI, USA
  - 4.2 m Wet Lap, incl. Baling Line and Controls
  - *Biggest single line Wet Lap Plant in the world.*

- **Veracel Celulose**
  - Eunapolis, Brazil
  - Sheet Drying Line 9.3 m
  - *Complete line from storage tower to finished bale — one of the largest in the world*

**Upgrades & Modernizations**

- **Mondi Kraft**
  - Richards Bay, South Africa
  - Sheet drying rebuild and capacity increase to 1600 t/d. Two new baling lines.
  - *Includes new “Autograding - Autotracking” technology*

- **Gulf States Paper**
  - Demopolis, Alabama, USA
  - Rebuild of Pulp Dryer (Ross)
### Mechanical Pulping

**Complete Lines & Systems**

- Stora Enso Veitsiluoto, Kemi, Finland
  - HC-Bleaching for SGW
- SCA Graphic Sundsvall, Ortviken Mill, Sundsvall, Sweden
  - TMP Bleaching System 400 admt/d
- MD Papier
  - Plattling, Germany
  - HC-Bleaching System
- Kruger
  - Wayagamack, Quebec, Canada
  - 350 tpd GWD Post Washing
- Henan Puyang Longfeng Paper
  - Puyang City, Henan Province, China
  - 330 t/d P-RC APMP System

**Key Equipment**

- UPM-Kymmene
  - Kaipola, Finland
  - Reject Screw Press
- Stora Enso
  - Summa, Finland
  - Steam cyclones
- Stora Enso
  - Niagara, WI USA
  - HC Mixer
- Trombini Embalagens
  - Curitiba, Parana, Brazil
  - HC refining

**Upgrades & Modernizations**

- Holmen Paper
  - Vargön, Sweden
  - Extension of Bleach Plant
- Holmen Paper
  - Hallstavik, Sweden
  - Twin Wire Press
  - 12th Twin Wire Press for Holmen
- Perlen Papier
  - Perlen, Switzerland
  - Upgrade 350 t/d
- Tembec
  - Malettere, Quebec, Canada
  - P-RC conversion

### MDF

**Complete Lines & Systems**

- Camsan
  - Ordu, Turkey
  - 500 t/d Pressurized Refining System for sawdust and chips
- Tever MDF
  - Istanbul, Turkey
  - Pressurized Refining System
- Shandong Liboirhua
  - Shandong Province, China
  - Pressurized Refining System
- Fujian Yongan Forestry
  - Yongan City, Fujian Province, China
  - Pressurized Refining System
- Asia Dekor Heyuan Woods
  - Shenzhen, Guangdong Province, China
  - Front-End Package consisting of Woodyard, Chip Washing, and Pressurized Refining System
- Guangdong Weihua
  - Meizhou City, Guangdong Province, China
  - Refining System including Woodyard and Chip Washing
- Guangxi GuanHua Beihai WBP
  - Beihai City, Guangxi Province, China
  - Pressurized Refining System
- Midland Construction via Dieffenbacher Vietnam
  - Pressurized Refining System
- Yankuang Group
  - Zoucheng City, Shandong Province, China
  - Pressurized Refining System
- Lian Shui Hui Tai Timber Industry
  - Jiangxi Province, China
  - Pressurized Refining System
- O.o.o. Kronostar
  - Scharya, Russia
  - Pressurized Refining System including Chip Washing
  - World's largest MDF Pressurized Refining System including Chip Washing
- O.o.o. Kronospan
  - Egorievsk, Russia
  - Pressurized Refining System
- Jiangsu Dare Wood
  - Fuzhou, Jiangxi Province, China
  - Front-End Package consisting of Woodyard, Chip Washing, and Pressurized Refining System
  - 2nd Line
- Shanghai Wanxiang Wood Industry
  - Shanghai Province, China
  - Pressurized Refining System including Chip Washing

### Fiber Preparation

**Complete Lines & Systems**

- Jiangxi Chenming Paper
  - Nanchang, Jiangxi Province, China
  - DIP system for 400 t/d for LWC grades (Incl. two dispersing stages)
- Heilongjiang Black Dragon
  - Qiqihar, Qiqihar Province, China
  - DIP system for 450 t/d for newsprint grades
- FS-Karton (Mayr-Melnhof Group)
  - Neuss, Germany
  - DIP system for 200 t/d for top layer for board machine
  - First complete line incl. sludge dewatering in Germany
- Nanping Paper
  - Nanping, Fujian Province, China
  - DIP system for 270 t/d for newsprint grades
- Guang Dong Jian Hui International
  - Dong Guang City, Guangdong Province, China
  - Complete Board Machine Approach System; Refining and Broke Handling
- Nine Dragon
  - Dong Guang City, Guangdong Province, China
  - Complete Board Machine Approach System
Shandong Tralin
Gaotang, Shandong Province, China
Two Complete Paper Machine Approach Systems

Stora Enso Hylte
Hyltebruk, Sweden
Complete FibreFlow® Drum concept

UPM-Kymmene
Changshu, Jiangsu Province, China
Complete Paper Machine Approach System; Disc Filter and Broke Handling

Key Equipment

Stora Enso Reisholz
Düsseldorf, Germany
Saveall disc filter
First new Andritz disc filter with 5.7m diameter

M-real Stockstadt
Stockstadt, Germany
Papillon refiners
New cylindrical refiner for bleached hardwood kraft pulp for coated fine paper and copy paper

Krempel Pressspanwerk
Thalheim, Germany
Papillon refiners
Refining of unbleached soft wood kraft pulp for fibreboard/pressboard, abrasive base paper with new cylindrical refiner

M-real Hallein
Hallein, Austria
Papillon refiner
Refining of bleached kraft pulp (beech) for printing and writing grades with new cylindrical refiner

Hebei Pan Asia Long-Teng Paper
Shijiazhuang, Hebei Province, China
Pulp screw presses SCP1410
LC discharge system for HC-Tower
Gravity tables GT 308

PowerDrain PD 1500 L
Sludge screw presses SCS 1408
Key components for 1,200 t/d DIP line for newsprint

Sappi Austria
Gratkorn, Austria
Wet and dry broke pulper for writing and printing grades
First new pulper with new rotor design

Norske Skog Bruck
Bruck a.d. Mur, Austria
Andritz CompaDis™ disperger for 160 t/d for LWC line
New Andritz disperger without heating screw

Stora Enso
Kvarnsveden, Sweden
Screening

Sun Paper, Taiyang Paper Industry
Yanzhou, Shandong Province, China
Stock preparation

Chenming Shouguan Paper
Shandong Province, China
Board Machine Approach System

UPM-Kymmene
Changshu, Jiangsu Province, China
Stock preparation

Upgrades & Modernizations

UPM-Kymmene
Steyermühl, Austria
Disc Filter upgrade

Norske Skog
Golbey, France
Disc Filter upgrade

Stora Enso
Kemi, Finland
Disc Filter and Paper Machine Approach System rebuild

Tissue Machines

Complete Lines & Systems

SCA Tissue North America
Florence, AL USA
Wet-Crepe Tissue Process Line

Swedish Tissue (LPC Group)
Kisa, Sweden
Pre-engineering for CrescentFormer tissue machine
2nd TissueFlex™ Machine for LPC

Ventilation & Drying
For Tissue and Paper Machines

Key Equipment

W. Hamburger
Pitten, Austria
Canopy Hood and Heat Recovery

Ronco Group
Mahoopany, PA USA
Heat Exchanger and Process Air System

Stora Enso Veitsiluoto
Veitsiluoto Mill, Finland
Paper Machine Hood

Kappa Sturso
Sturovo, Czech Republic
Rebuild of Air System and Heat Recovery

SCA
Flagstaff, AZ USA
Yankee Hood and Process Air System

Procter & Gamble
Green Bay, WI USA
Yankee Hood and Process Air System

This new 5.5 m wide Andritz PrimeLine™ tissue machine for Kriepa Hygiene papier in Kriebstein, Saxony, Germany features the most advanced tissue technology available today.
Wood Processing

Complete Lines & Systems

Celulosa Arauco y Constitución Valdivia, Chile
Complete wood processing system with two debarking lines for eucalyptus and pine

Jiangsu Dare Wood Danyang, Jiangsu Province, China
Complete wood processing system with two debarking lines for eucalyptus and pine

MDF Woodyard Yueyang City, Hunan Province, China

Shandong Chenming Paper Shouguang City, Shandong Province, China

Complete Lines & Systems

Weyerhaeuser New Bern, NC USA
Tree length debarking system

Stora Enso Baienfurt Baienfurt, Germany
Groundwood debarking line and grinder feeder extension

Korsnäs Gävle, Sweden
Chipping line

Upgrades & Modernizations

Weyerhaeuser Canada Grande Prairie, Alberta, Canada
Upgrade of 2nd P & H crane

Sappi Skowhegan, ME USA
Chip Bin Modernization with CantiScrew Reclaimer - turnkey

Chemical Pulping

CENIBRA - Celulose Nipo-Brasileira Fonseca, Brazil
Lime Kiln Modernization

Suzano de Papel e Celulose Suzano, Sao Paulo, Brazil
Lime Kiln and Recausticizing retrofit

Ripasa Limeira, Brazil
Lime kiln, CPR- filter LMD, sector cooler, make-up system

Metsä-Botnia Kemi, Finland
Stirox, White Liquor Oxidation

Metsä-Botnia Kaskinen, Finland
Evaporation plant modification

Franzschach Pulp and Paper St. Gertraud, Austria
Evaporation plant retrofit

Fiber Preparation

Complete Lines & Systems

Vipap Videm Krško Krško, Slovenia
Complete turnkey Deinking Line for 400 t/d for standard and upgraded newsprint

UPM-Kymmene Shotton, Deeside, Great Britain
Pulping, Coarse Screening, Dewatering, Dispersing, Sludge dewatering for 900 t/d line for newsprint. Biggest pulp screw press and disperger in the world

Stora Enso Reisholz Düsseldorf, Germany
Saveall disc filter
First new Andritz disc filter with 5.7m diameter

Sappi Austria Gratkorn, Austria
Wet and dry broke pulper for writing and printing grades
First new pulper with new rotor design.

Mechanical Pulping

Complete Lines & Systems

Holmen Paper Wargöns Mill, Vargön, Sweden
Upgrade of Bleach Plant

UPM-Kymmene Jämsänkoski, Finland
Jyvähara Refiner rebuild

Zubilade Aizarnazabal, Spain
Jyvähara Refiner rebuild

Millar Western Whitecourt and Meadow Lake, Canada
Screen room upgrade

Tissue Machines

Complete Lines & Systems

Kriepa Hygienepapier Kriebstein, Saxony, Germany
PrimeLine™ Tissue Machine with TissueFlex™ Press
Most-advanced Tissue Machine Concept
* Trademark of Voith, cooperation partner of Andritz in the field of tissue

Guangxi Guitang Guigang City, Guangxi Province, China
2 Identical Tissue Machines
Use of up to 80% bagasse as raw material

Changde Hengan Paper Products Changde City, Hunan Province, China
Tissue machine
Final acceptance after only 5 months

Upgrades & Modernizations

Gomà-Camps La Riba, Spain
Tissue Machine Modernization
1st PrimeControl Automation System

Renova Torres Novas, Portugal
Major Tissue Machine Rebuild

Ventilation & Drying

For Tissue and Paper Machines

Key Equipment

Metsä Tissue Krapkowice, Poland
New Yankee Dryer and Hood

Metsä Tissue Raubach, Germany
New Yankee

Gomà-Camps La Riba, Spain
Tissue Machine Modernization
1st PrimeControl Automation System

Renova Torres Novas, Portugal
Major Tissue Machine Rebuild

Key Equipment

Gebr. Grünwold Kirchhundem-Hofolpe, Germany
New Hood for MG Paper Machine

Start-ups

Wood Processing

Complete Lines & Systems

Celulosa Arauco y Constitución Valdivia, Chile
Complete wood processing system with two debarking lines for eucalyptus and pine

Jiangsu Dare Wood Danyang, Jiangsu Province, China
Complete wood processing system with two debarking lines for eucalyptus and pine

MDF Woodyard Yueyang City, Hunan Province, China

Shandong Chenming Paper Shouguang City, Shandong Province, China

Complete Lines & Systems

Weyerhaeuser New Bern, NC USA
Tree length debarking system

Stora Enso Baienfurt Baienfurt, Germany
Groundwood debarking line and grinder feeder extension

Korsnäs Gävle, Sweden
Chipping line

Upgrades & Modernizations

Weyerhaeuser Canada Grande Prairie, Alberta, Canada
Upgrade of 2nd P & H crane

Sappi Skowhegan, ME USA
Chip Bin Modernization with CantiScrew Reclaimer - turnkey

Chemical Pulping

CENIBRA - Celulose Nipo-Brasileira Fonseca, Brazil
Lime Kiln Modernization

Suzano de Papel e Celulose Suzano, Sao Paulo, Brazil
Lime Kiln and Recausticizing retrofit

Ripasa Limeira, Brazil
Lime kiln, CPR- filter LMD, sector cooler, make-up system

Metsä-Botnia Kemi, Finland
Stirox, White Liquor Oxidation

Metsä-Botnia Kaskinen, Finland
Evaporation plant modification

Franzschach Pulp and Paper St. Gertraud, Austria
Evaporation plant retrofit

Fiber Preparation

Complete Lines & Systems

Vipap Videm Krško Krško, Slovenia
Complete turnkey Deinking Line for 400 t/d for standard and upgraded newsprint

UPM-Kymmene Shotton, Deeside, Great Britain
Pulping, Coarse Screening, Dewatering, Dispersing, Sludge dewatering for 900 t/d line for newsprint. Biggest pulp screw press and disperger in the world

Stora Enso Reisholz Düsseldorf, Germany
Saveall disc filter
First new Andritz disc filter with 5.7m diameter

Sappi Austria Gratkorn, Austria
Wet and dry broke pulper for writing and printing grades
First new pulper with new rotor design.

Mechanical Pulping

Complete Lines & Systems

Holmen Paper Wargöns Mill, Vargön, Sweden
Upgrade of Bleach Plant

UPM-Kymmene Jämsänkoski, Finland
Jyvähara Refiner rebuild

Zubilade Aizarnazabal, Spain
Jyvähara Refiner rebuild

Millar Western Whitecourt and Meadow Lake, Canada
Screen room upgrade

Tissue Machines

Complete Lines & Systems

Kriepa Hygienepapier Kriebstein, Saxony, Germany
PrimeLine™ Tissue Machine with TissueFlex™ Press
Most-advanced Tissue Machine Concept
* Trademark of Voith, cooperation partner of Andritz in the field of tissue

Guangxi Guitang Guigang City, Guangxi Province, China
2 Identical Tissue Machines
Use of up to 80% bagasse as raw material

Changde Hengan Paper Products Changde City, Hunan Province, China
Tissue machine
Final acceptance after only 5 months

Upgrades & Modernizations

Gomà-Camps La Riba, Spain
Tissue Machine Modernization
1st PrimeControl Automation System

Renova Torres Novas, Portugal
Major Tissue Machine Rebuild

Ventilation & Drying

For Tissue and Paper Machines

Key Equipment

Metsä Tissue Krapkowice, Poland
New Yankee Dryer and Hood

Metsä Tissue Raubach, Germany
New Yankee

Gomà-Camps La Riba, Spain
Tissue Machine Modernization
1st PrimeControl Automation System

Renova Torres Novas, Portugal
Major Tissue Machine Rebuild

Key Equipment

Gebr. Grünwold Kirchhundem-Hofolpe, Germany
New Hood for MG Paper Machine