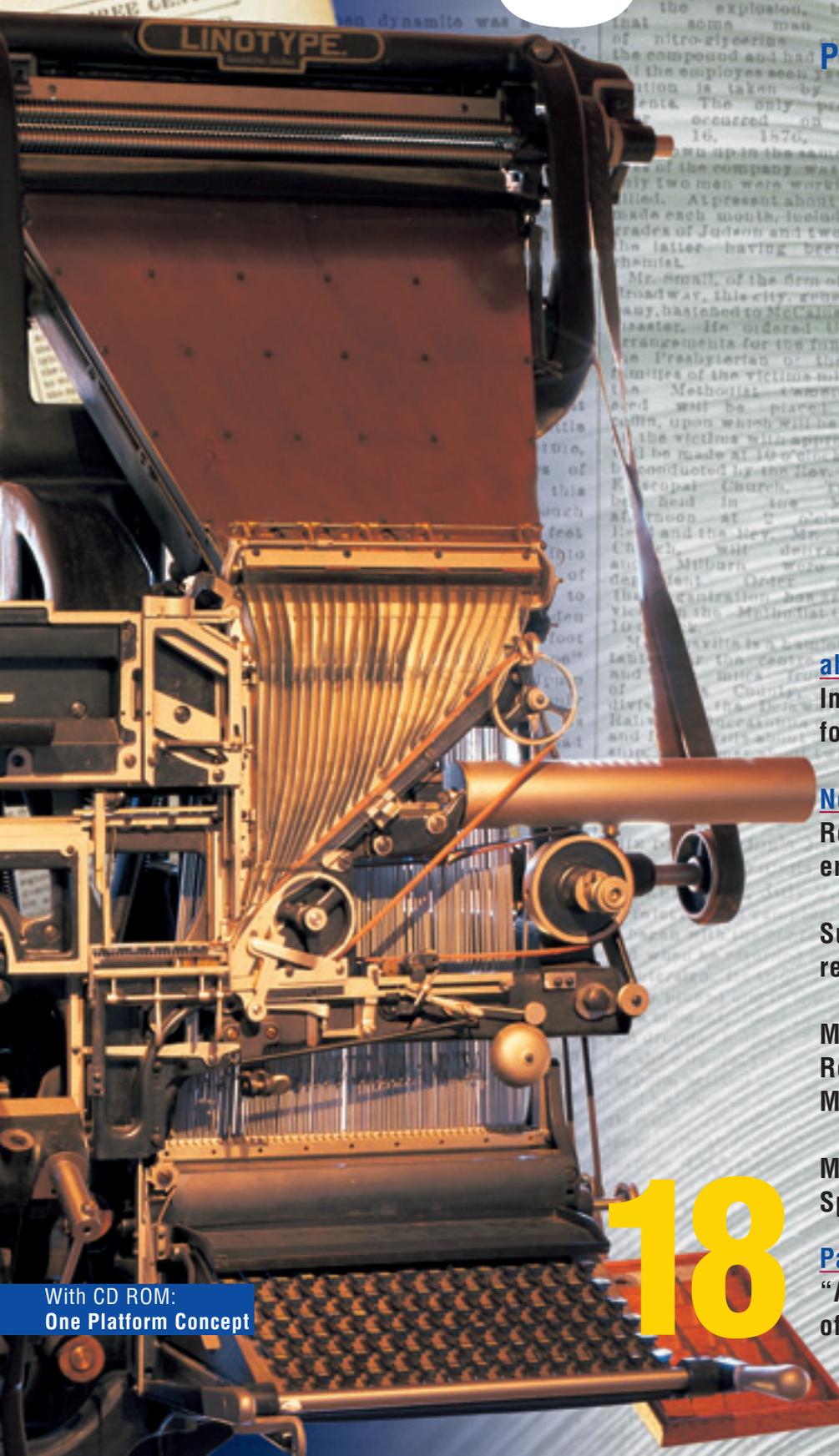


two together

Paper Technology Journal



ahead 2004:

International Customer Conference for Board and Packaging Papers.

News from the Divisions:

Reading matter from 100% recovered paper for the United Kingdom.

Success in South Africa – Mondi relies once more on Voith Paper.

Mission 2004 – Rebuild of StoraEnso's Board Machine 3 at Baienfurt Mill.

Minfeng PM 21 – Specialist for specialty papers.

Paper Culture:

"A line of types" – 150th anniversary of the birth of Ottmar Mergenthaler.

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With CD ROM:
One Platform Concept

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PAPER CULTURE

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*Front page: Ottmar Mergenthaler's
Linotype was the breakthrough that
dramatically speeded up the setting
of type in the printing industry.
It led to larger newspapers and thus
to a greater demand for newsprint.*



Hans Müller

Dear Customer, Dear Reader,

Once in a while one is tempted to look into the crystal ball with the notion that there might be continued positive signs as far as the worldwide pulp and paper industry is concerned.

Judging by our recent order intake things are looking good and the same is true for sales revenue. The business segments that look the brightest are certainly the continued strong demand for paper and board production lines for China as well as the recent influx of orders of complete new production lines for board and packaging grade, particularly so for Europe.

In the U.S., improved economic activity should lead to increased demand for paper and forest products with first volumes and then prices for most commodities continuing to improve over time. The paper industry in the former Soviet Union operates near peak capacity. This situation could trigger major machine and system rebuilds in this geographic area, albeit we do not see major investments into new machines at this point.

South America, that is foremost Brazil and Chile, continue to be markets with good potential for suppliers like Voith.

The activities in Asia, other than China, continue at a rather reduced rate mainly in the rebuild sector. This is a segment in which our Joint Venture Voith-IHI continues to do exceptionally well.

The recently concluded DRUPA exhibition in Düsseldorf was a full success for the printing and converting machinery suppliers. This is to be considered a real turnaround and a sign of recovery of our customers' customers.

All in all, we continue to be cautiously optimistic and trust that rising Asian demand for fibre as well as increased energy prices will not dampen the apparent recovery in the forest product industry prematurely.

With this positive notion in mind I wish you interesting and enjoyable reading.

A handwritten signature in blue ink that reads "Hans Müller". The signature is fluid and cursive, written in a professional style.

Hans Müller

on behalf of the Voith Paper Technology team



**ahead 2004 –
International Customer Conference for Board and
Packaging Papers in Vienna from May 5 to 7, 2004**



Thomas Genz

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In May of this year, Voith invited the producers of board and packaging papers to the ahead 2004 Customer Conference in Vienna, which was held for the third time. Under the motto “Reliability beyond Equipment”, experts from all over the world discussed during three days future developments in the paper industry and possible solutions for future challenges.



Wednesday, May 5, 2004

The Customer Conference started with a press conference, to which representatives of the international trade press had been invited. In an intensive exchange of information, the representatives of the media talked with the Executive Managers present about current technological trends for board & packaging papers, as well as about markets, innovations and references.

Following the press conference, the Customer Conference was officially opened at the venerable Auersperg Palace on the well-known Wiener Ringstraße. The

baroque building from the early 18th century, where Wolfgang Amadeus Mozart's musical masterpieces had been performed at his time, provided a tremendous ambience to get the guests in the right mood for the eventful days in the city on the Danube. After the musical treat of a short concert by the Wiener Sängerknaben, Dr. Hans-Peter Sollinger, Member of Corporate Management Board of Voith AG, welcomed a total of 500 participants from all five continents. In a relaxed atmosphere, new contacts were made, many acquaintances met again, and lively discussions were held on novelties in the paper industry.



Thursday, May 6, 2004

Under the motto “Reliability beyond Equipment”, the next day started with a series of diverse lectures. After Rudolf Estermann, Executive Vice President of Voith Paper St. Pölten, had held his welcome speech, Dr. Sollinger reported on the changes between Voith as supplier for the paper industry and its customers. He made it clear that Voith has evolved from a first-class machine supplier to a process and service supplier over the years and has thus positioned itself correctly for the future.

The Conference title “Reliability beyond Equipment” was closely linked with this overall process competence, standing not only for the necessity of excellent and high-quality mechanical engineering solutions for successful operation of a production line, but also for the fact that only extensive experience and competence in process technology, combined with long-lasting partnerships between Voith and its customers, can ensure long-time and reliable performance of new or rebuilt production lines over their entire life cycle.

In his lecture “Fibre Flows of Future Packaging”, the guest speaker Tapio Korpeinen from Jaakko Pöyry Management Consulting talked about the paper and board markets, while considering in particular the regional fiber demand.

Selected topics from the fields of packaging papers and board and further process topics were then presented in three blocks. The direct correlation between the individual process stages – from



stock preparation to finishing – and other decisive components, such as clothing and automation, played a significant role. Two of a total of four other lectures by guest speakers on that day proved Voith’s competence in rebuilds and new production lines: The two responsible technical mill managers Werner Ofenböck (Hamburger, Pitten) and Helmut Endler (StoraEnso Baienfurt) reported on the paper and board machines recently put into operation at Hamburger AG in Pitten, Austria, and at StoraEnso Packaging Boards in Baienfurt, Germany. Due to the

complexity of the projects, the rebuilds of Hamburger PM 4 and of StoraEnso BM 3 were special challenges. In the Baienfurt machine for example, an entirely new Voith calendering technology – the Nipco-Flex calender – has been used. The speaker reported that the advantages compared to the conventional Yankee dryer became apparent immediately after the start-up.

The first day of the Conference was impressively rounded off by cruising the Danube on board the historical steamer “MS Stadt Wien” and by a gala dinner.





Music and magicians provided a comfortable atmosphere, making the evening a unique and impressive event.

Friday, May 7, 2004

The second day of presentations focused on Voith's R&D activities. Various new products and concepts documented that Voith, with more than 5,000 valid patents and 250 applications for new patents annually, is among the world's most innovative companies to design large-scale production lines in the paper technology field. R&D topics of particular interest on the agenda included the DF Coater technology (direct fountain), the Boost Dryer drying concept and the innovative SeaLencer sealing strip.

The lectures by the two guest speakers José Manuel Barroso, SAICA's Mill Manager in Zaragoza, Spain, and Mika Joukio, President and Mill Manager of m-real Äänekoski, successfully rounded off the second day of the Conference.

At the end of the event, more than 300 persons left after the lunch break for a reference tour to Hamburger AG in Pitten to inspect the rebuilt PM 4. After the welcome by the production and technical manager of the Hamburger Group, Harald Ganster, the guests had the opportunity to inspect the paper machine and obtain information on the successful start-up. In parallel, a smaller group of persons went to St. Pölten to visit the Voith works and inspect, among other things, pre-assembled components for the "Varel" order.

The Conference has again underlined that the cooperative dialogue between the paper producers and the technology supplier is the basis for lasting success. Not only excellent know-how in mechanical engineering, but also extensive process competence, and above all the resulting operational reliability of the production lines, are decisive factors for efficient production technologies. During this Conference, Voith put great emphasis on its extensive process competence, underlining once again its position as a reliable partner for complete production lines and rebuilds.



Norske-Skog Parenco – Water management system secures fresh water savings



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Eighteen months after implementing a millwide water management system, it is time to assess the effective fresh water savings and the influence on process water quality.

In summer 2002 the new DIP 6 deinking line for 620 t/24 h finished stock was successfully commissioned at Norske-Skog's Parenco mill in the Netherlands. Voith Paper was entrusted with the engineering of this line and various subsystems, and also with the delivery of key technological components. To ensure the faultless integration of all new sections, Voith carried out a millwide system analysis with the assistance of Parenco technologists. All production-relevant subsystems were checked on site and evaluated.

In view of the increased capacity and Parenco's quality strategy, the most important finding of this investigation was that **the entire process water system had to be optimized**. The main aspects were the limited fresh water resources,

limited capacity of the existing biological effluent treatment system as well as the need to comply with restrictions set by the local authorities. The technological objectives were to improve process water quality and quality constancy under all operating conditions, and to introduce an appropriate temperature profile for the stock-water system, taking account of the mill's overall heat and energy balance. To reach these goals in the complex mill environment, a **water management system** was developed once the "hardware" requirements had been met.

This water management system was engineered and carried out in the following stages:

- Installation of additional MC towers for a more flexible finished stock storage
- Allocation and design of associated

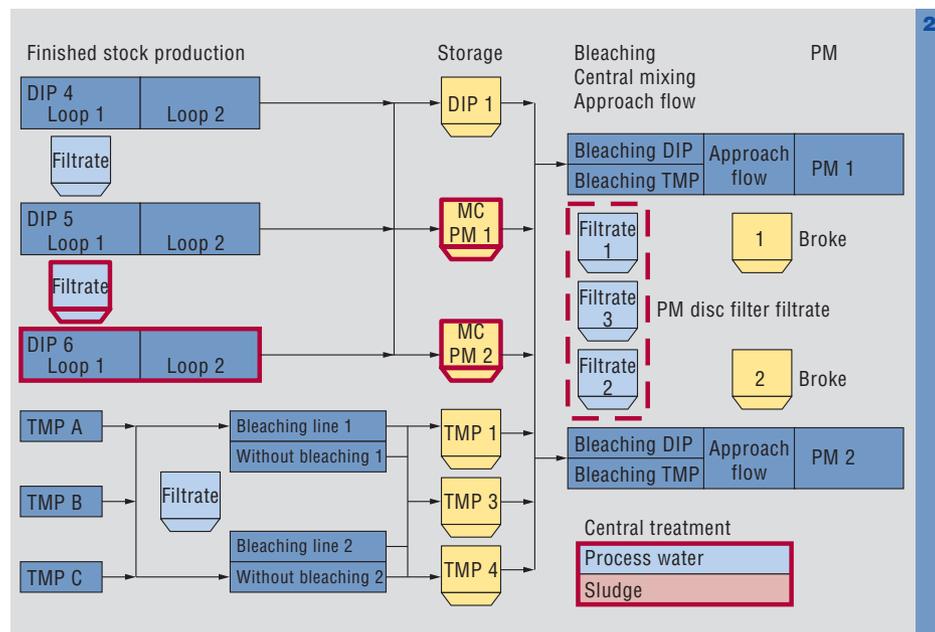
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- dynamic stock and water storage facilities
- Optimization of water flows and cooling in the water loops
 - Rebuild of the saveall disc filters of both paper machines, and optimization of disc filter periphery
 - Changeover from whitewater storage to clear filtrate storage for both paper machines in July 2002
 - Implementation of an overriding control strategy for the entire process water system in September 2002
 - Training of mill personnel and commissioning.

Parengo production profile

On two paper machines Parengo produces standard and improved newsprint with basis weights from 42 to 56 g/m², as well as SC grades. Gross annual production totals around 460,000 tons per year. The furnish used is on the one hand thermomechanical pulp (TMP), produced on three TMP lines with a share of 10 to 25%, and on the other hand deinked stock prepared from a mixture of recycled newspapers and magazines on three deinking lines (DIP 4-6) with a share of 75 to 90%. Different oxidative and reductive bleaching lines also enable TMP and deinked stock to be used for improved paper grades.

Fig. 2 shows the new central treatment system for all deinking sludges together



with the central process water clarification. The rebuild of the whitewater storage system including the saveall disc filters into a systematic clear filtrate system is also shown.

Results

After establishing specific water consumption figures, numerous engineering alterations were undertaken, involving whitewater and filtrate management, disc filter design and control, fresh water allocation and control, balancing of associated stock and water storage, heat exchanger systems and effluent discharge and control. Without increasing the capacities of the four existing saveall disc filters, these measures enabled the re-

Fig. 1: Norske-Skog Parengo mill, Netherlands.

Fig. 2: Millwide system concept at the Norske-Skog Parengo mill.

moval of solids from the entire excess whitewater, which is now stored as clear filtrate with a defined low solids content. The previous whitewater towers now store exclusively clear filtrate, which is used as make-up water in stock preparation, for broke pulping and to replace fresh water in the paper machine shower water system.

Fig. 3 shows the success of these rebuild measures as a function of the total **suspended solids content** (TSS) measured in the three clear filtrate towers. Prior to the rebuild, the total solids content was 2000 to 4000 mg/litre, with considerable fluctuation. Afterwards, it fell to less than 500 mg/litre, with only slight variations. This represents a significant contribution

Fig. 3: Solids content in the process water system of PM 1 and PM 2.

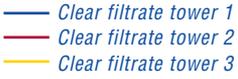
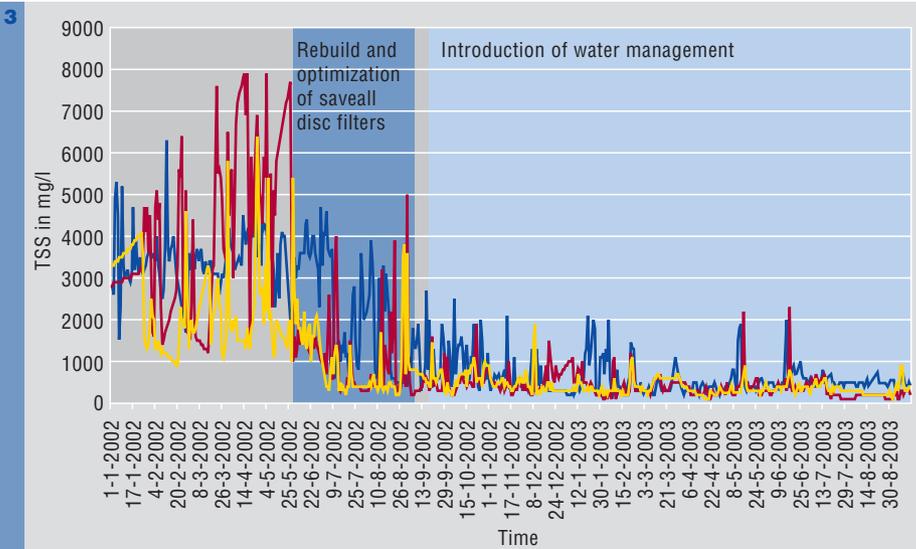
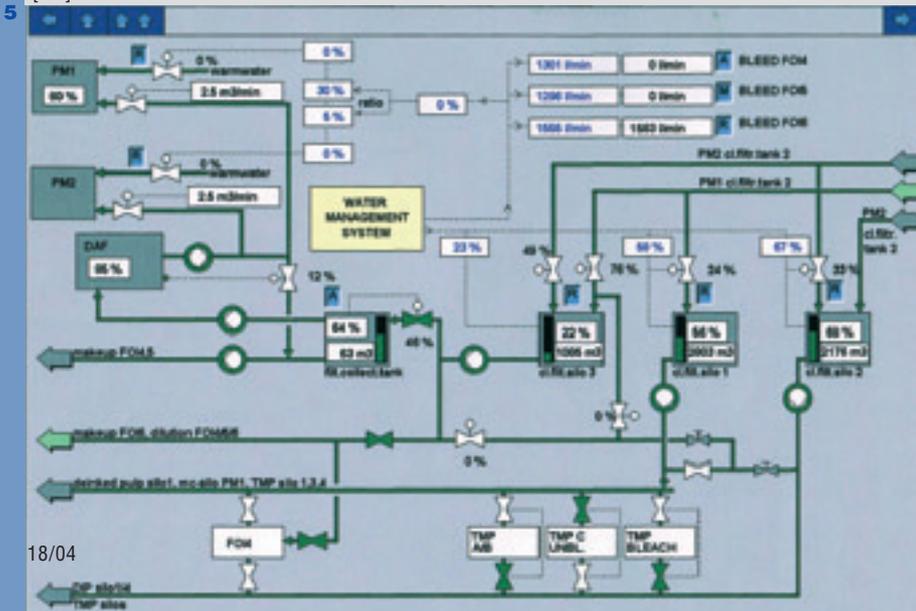


Fig. 4: Savings and process stability thanks to the water management system (WMS).

Fig. 5: Process control visualization.



Period	1-8/2002		2003		1-5/2004	
	without WMS		with WMS		with WMS	
	Value	Standard deviation	Value	Standard deviation	Value	Standard deviation
Spec. fresh water intake [m ³ /t]	13.6	3.7	11.9	2.4	12.1	2.0
Effluent [m ³ /24 h]	11,600	2,500	12,990	1,700	12,570	1,270
Saveall capacity [m ³ /24 h]	44,600	-	63,400	-	63,400	-
Stock-water volume [m ³]	18,700	2,830	17,000	945	17,000	890



towards reducing uncontrolled solids and contaminants recirculation, thus improving stability in the production process.

The improved **process stability** is clearly documented by the variation in fresh water intake, the active system volume (stock and water volumes actually stored) and effluent volumes. As shown in Fig. 4, the scatter band for these consumption and system parameters has been decisively reduced, expressed here as absolute standard deviation. This logically results in a more uniform content of disturbing substances and useful process chemicals in the water, which has a positive effect on process constancy and controllability as well as on product quality.

Operator acceptance of a millwide water management system intervening into automation systems and into the responsibilities for various production areas is critically dependent on the simplicity of handling the process control system. That is why Voith placed great emphasis on complete automation, clear visualization of stock and water storage systems, consumption data and parameters, as well as overall functionality of the process water control. The process control system information serves for operators in all system areas, with selected access rights for operator intervention. Fig. 5 shows, for example, a typical process control monitor display visualizing a part of the water management func-

tion important for the paper machine operator. Visible are the clear filtrate towers controlled via the central system module, and the remote controls for mill water intake and effluent discharge. User-friendliness also means that all operating situations deviating from the stable production conditions are regulated by the water management system to minimize resource consumption and ensure optimum process stability. At sheet breaks, this lets the paper machine operators concentrate fully on the situation in the press and dryer sections, since the peripheral stock-water system adequately responds, in other words it is fully in control of the situation!

Savings

Eighteen months after optimizing the water system and implementing the water management system in September 2002, the Norske Skog technologists drew a balance. The requirement by the authorities for a maximum fresh water intake of 5.7 million m³ per year at the Parenco mill was easily met in 2003 with only 5.1 million m³ per year. For a net paper production of 427,000 tons per year this corresponds to an average specific fresh water intake of 11.9 m³/ton. Compared with the average freshwater consumption of 13.6 m³/ton in 2002, this is equivalent to a 12.2% reduction. Not included in this comparison are the positive effects of optimization at the end of 2002, so that the actual improvement is even greater.

Remco Feijten

Process Engineer,
Norske-Skog
Parenco,
Renkum



“Right from the beginning we realized the importance of a millwide system analysis at our Parenco mill in order to minimize risks on integrating the new DIP 6 deinking line. That is why we fully supported our partner Voith in collecting and evaluating all the necessary data. Our existing water system would never have met the new requirements after installing the DIP 6 with its more flexible stock production and storage philosophy.

Our wide product range, with the necessary grade changes and frequent starting and stopping of the TMP and deinking lines, demanded frequent manual intervention and individual operator communications to master the water household. After optimizing the process water system we prepared ourselves thoroughly for implementing the millwide water management system. It was important to me that the people operating our production lines understand how the system works.

That is why I carried out training courses with my production colleagues to cover the new process water management system prior to commissioning.

For the functional engineering, several different process control systems of different generations had to be linked up. Nevertheless, the commissioning and control system detailing were trouble-free. Meanwhile we have gained adequate experience with this new system, and our plant operators are very satisfied with the automated water management. Shut-downs, sheet breaks and occasional manual interventions are now compensated very efficiently.

Previous daily peaks in our fresh water intake or effluent volume have been greatly reduced.

Specific fresh water intake was reduced between 2002 and 2003 by 1.7 m³/tons. We are currently working hard on further improvements to our stock preparation system and paper machine runnability. This will open up further potential for reducing our future fresh water intake at Parenco.

For us, water management is an important module and tool for achieving and maintaining our systematic cost reduction and quality enhancement strategy.”



Hamburger Spremberg orders new recovered fibre plant

W. Hamburger AG is an Austrian paper group specializing in the production of high-grade corrugating medium and packaging papers.



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Josef Bruckner

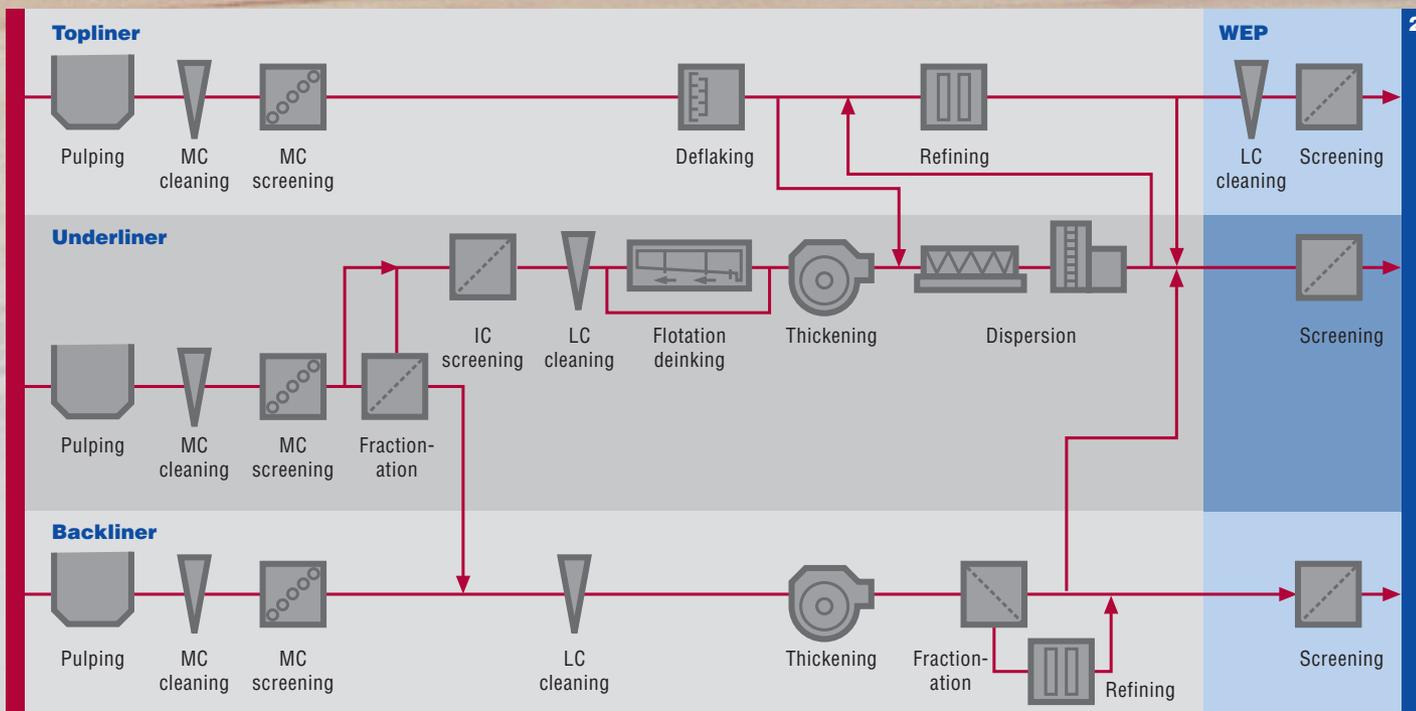
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Following Voith's orders for complete stock preparation lines for packaging papers received last year from Wuxi Longcheng / China, Emin Leydier / France and Adolf Jass, Schwarza / Germany, the Austrian paper group Hamburger signed the latest order with Voith in November 2003. The new plant is being built on the Schwarze Pumpe industrial estate, Spremberg in Lausitz/Brandenburg, Germany on the site of a former power plant.

The investment, which will have a total capacity of approximately 265,000 t/year, is the largest project in the history of the Hamburger Group and also an important factor in the development of the region. Long term the new mill will create over 260 jobs and 24 trainee placements.

The 100% recovered fibre plant is designed for a total capacity of 1,500 t/24 h. Voith's delivery will comprise three separate stock preparation lines for topline, underliner and backliner, including approach flow system screening and broke pulping under the paper machine. The stock preparation system includes pulping, screening, fractionation, cleaning, flotation deinking, dispersion, thickening, refining, as well as process water and reject handling technology.

For the underliner and backliner lines the pulping system consists in each case of a Unipulper, a Junkomat, Contaminex for handling the pulper discharge and a ragger. For coarse screening the mill will use disc screens (turboseparators) for the



first two screening stages followed by a Combisorter for the final stage. For refining the long fibre, TwinFlo refining will be used in the underliner and backliner lines. The underliner line can be fed with brown as well as white recovered paper grades, depending on whether fluting, testliner or white top testliner is being produced. Where white recovered papers are used, this furnish is first cleaned using EcoMizer technology and then passed to an EcoCell flotation deinking plant for removal of printing inks. A dispersion stage follows using a DX disc disperger for the efficient separation of any residual printing inks from the fibres and their reduction in size, as well as for the reduction in size of dirt specks and stickies.

Stock thickening is provided by a Thune bagless disc filter and a Thune screw press. Here, too, Hamburger has decided on the most modern technology available today.

Meri Entsorgungstechnik, Munich, a Voith Paper joint venture partner, is supplying all equipment for rejects handling and water treatment such as Compactor, two Elephant thickeners, Sedimator, two Screenex units as well as various conveyors.

In the approach flow systems, a sensitive area and decisive for obtaining a superior and consistent end product quality, MultiScreen technology, equipped with C-bar screen baskets is being installed.

Fig. 1: The construction site in Spremberg.

Fig. 2: Schematic diagram of Spremberg's stock preparation system.

Voith is also responsible for the delivery of CompactPulpers, the new generation of broke pulpers under the paper machine.

Apart from equipment, Voith will supply the process, control and instrumentation engineering services as well as supervise erection and commissioning.

The new paper mill is scheduled to come on stream in the second quarter of 2005.



Reading matter from 100 % recovered paper for the United Kingdom



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Great Britain's largest newsprint paper mill in Shotton, Wales, a member of the UPM-Kymmene Group, has been upgraded. These days, any newspaper read in Britain is most probably a Welsh-Finnish product. And also an environmentally friendly one, since the ambitious aim of the modifications – apart from the planned PM 1 and PM 2 productivity increase – has been to use 100 % recovered paper as raw material. Thus the project name: "100 % Shotton".





Fig. 1: EcoCell flotation deinking cells.

Fig. 2: UPM-Kymmene, Shotton.

Fig. 3: MultiScreen fine screening.

The start-up of the new RCF3 (RCF = Recycled Fibre) preparation plant on 11th November 2003 signified completion of the change-over from the previous raw material (recovered paper and TMP) to 100% recovered paper.

Voith's scope of delivery for the "100% Shotton" project included the supply of the key components such as the EcoCell flotation cells (Fig. 1), MultiScreen fine screening (Fig. 3) and cleaning, the complete engineering of the new RCF3 plant as well as the rebuild of RCF1, (originally started up in 1989 as a 1-loop system) to a 2-loop system. All raw materials handling equipment for the RCF3 plant was supplied by B+G, a Voith subsidiary.

In addition, UPM asked Voith to carry out a system analysis and water management study for the entire paper mill and to rebuild the existing stock preparation additive systems for the RCF plants.

With the UPM-Kymmene order Voith has added another dimension to its cooperation with the Finnish UPM Paper Group since this was the first time that UPM had chosen Voith to supply the complete engineering for a project of this size.

The preceding engineering work carried out by Voith and the resulting very short and trouble-free commissionings of the former Haindl plants in Augsburg, Renkum and Steyermühl were certainly deci-



Fig. 4: The existing RCF1 plant was extended by an EcoCell flotation deinking line in the new Loop 2.

Fig. 5: Fan pump system in the basement of the new RCF3 plant.

sive factors in obtaining this order. All the more so as these mills come off very well when comparing, for instance, benchmarks such as runnability and energy consumption.

The rebuild of RCF1 to a 2-loop system was especially challenging for Voith. On the one hand, the new Loop 2 had to be fitted into the existing building (**Fig. 4**) whilst at the same time the tie in's had to be integrated into the existing plant as smoothly as possible, and without shutting down the plant. The excellent on-site cooperation between the Shotton project team and Voith's engineering, erection and commissioning teams as well as the accurate 3D system planning and precisely timed tie in's made a trouble-free plant start-up possible.

Through improved control philosophy and technological changes process stability and stock quality could both be



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significantly improved. For instance, by installing a new Voith fine screening system the stickies content and also the stickies variance were reduced by more than 50%.

Timo Heinonen: *“Despite our high expectations the rebuild results have been even better than foreseen.”*

During the first phase of the RCF3 project, Voith in close cooperation with UPM technologists designed a modern, closed 2-loop system (**Fig. 5**) with a high degree of automation. In this project engineering

phase many concepts and variants worked out by Voith were discussed. The results gained from the mill-wide system analysis and water management study proved to be of great use here. For example, conclusions could be drawn from these results and from values measured at similar plants concerning the CSB content after shutting down the TMP plant. This analysis had a significant influence on the conceptual design of the new RCF3 plant. As a consequence, UPM decided not to install a screw press in the second loop in order to save investment and operating costs.



5

The plant layout had already been presented using special 3D visualisation software (**Figs. 6 and 7**) and discussed during project meetings in the planning phase. This enabled the highly experienced Shotton project team to bring in their own ideas and visions. In the course of further planning, collision checks were continuously carried out with this 3D planning system. This greatly helped to avoid time-consuming modification work during erection. In addition, the pipe sup-



**Timo
Heinonen**

Project Director



**Andrew
Bronnert**

Project Manager

plier was able to prefabricate much of the piping based on the isometrics provided by Voith Paper.

The user-friendly monitor displays and easy operation of the new RCF3 plant enable the papermakers to start up and shut down the entire stock line, including flushing, in approximately 20 minutes using the command "Main Group Start". Production control is certainly another highlight for the plant operators, allowing them to accurately set the required production using only one control button.

On 11. 11. 2003 it was all stations go. Following a meticulous start-up schedule which included thorough checks and water tests the plant was started up. Just one hour after start-up using the main group start switch the full 810 t/24h production was running. One of the most important reasons for this perfect start-up was certainly the several weeks of software testing ahead of commissioning. Here, each individual function of the 1014 control circuits had been simulated and thoroughly tested.

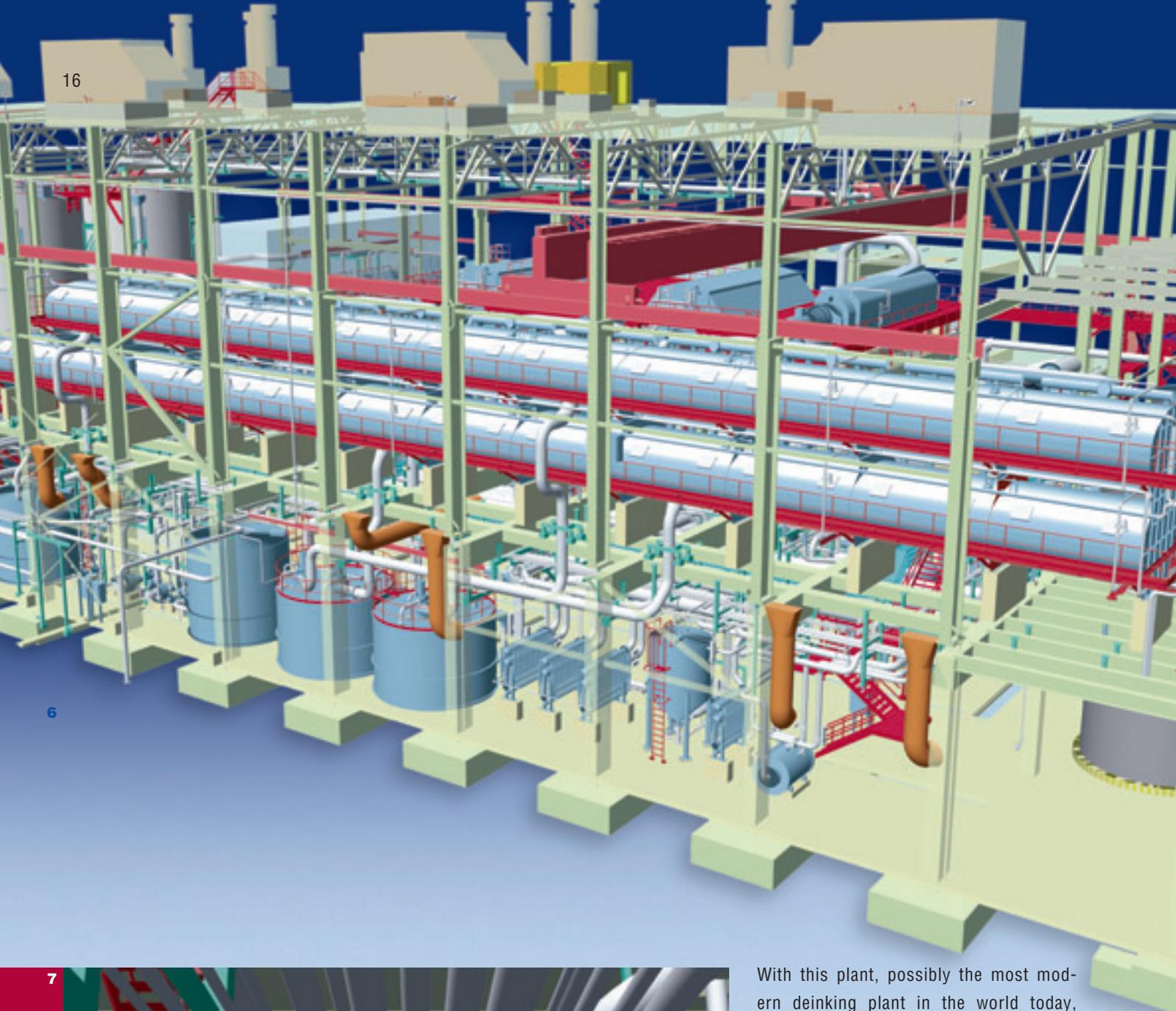
"By changing over to 100 % recycled paper we have been able to significantly increase the recycling rate for the whole of Great Britain. What this means is that from start-up of RCF3, recovered paper from approximately 4 million households can be additionally recycled to newsprint paper in Shotton. With the implementation of this project we have not only significantly reduced our raw material costs but also the energy costs for the entire mill.

As an important international company and after having consulted our new colleagues from the former Haindl plants, we decided for the first time to place a major engineering order with Voith for the RCF3 design planning and for the RCF1 rebuild. In the course of the project it quickly became apparent that our different approaches to planning ideally complemented each other.

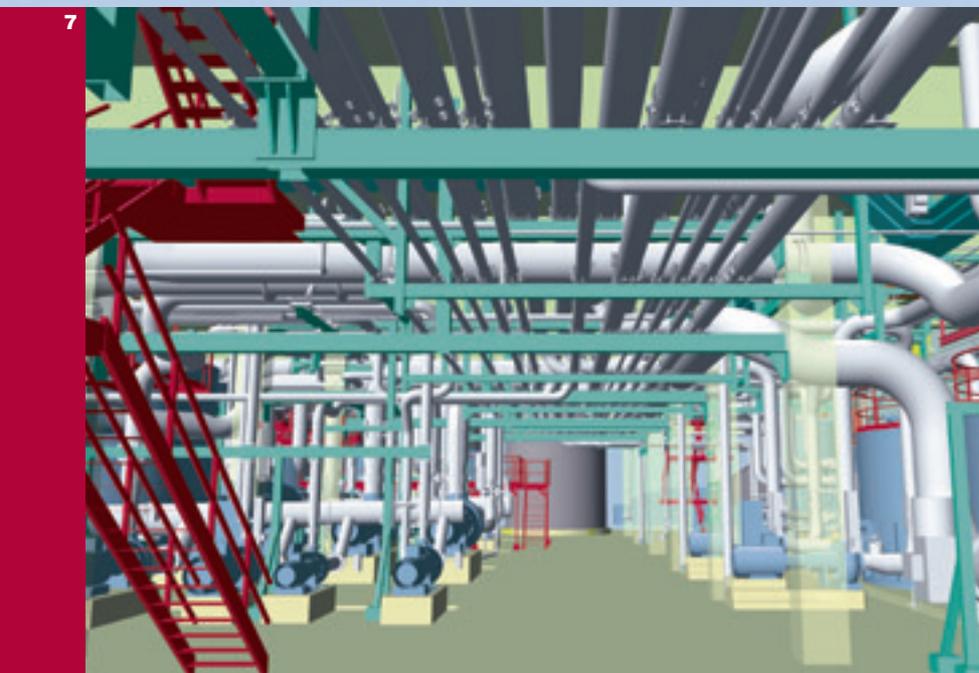
We believe that Voith's complete process competence together with our technologists and production team and their specific knowledge have resulted in an ideal concept as regards investment costs, quality requirements and efficiency.

The problem-free start-up after the complicated RCF1 rebuild to a 2-loop system has confirmed our view that Voith was the right partner for the implementation of this project. We had therefore set a very high standard for the RCF3 start-up. Here, too, our expectations were exceeded and the plant was put into operation on schedule. Even our critical officials from the Health and Safety Department, who inspected the up and running plant with regard to safety in the workplace, were full of praise for Voith's risk analyses and safety standards.

We thank you for your good cooperation and wish you all the best for the future."



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With this plant, possibly the most modern deinking plant in the world today, UPM-Kymmene has set another significant milestone in its successful and long-standing tradition of recycling. And for the first time with UPM-Kymmene, Voith was not only the supplier but also a partner in the project development. This is something Voith is proud of. At the same time Voith would be honoured to be able to contribute to the economic success of the UPM-Kymmene Group in the future, too, thus further strengthening the partnership in recovered paper recycling.

Figs. 6 and 7: 3D computer planning of Shotton RCF3, overall view (top) and part view of the basement (bottom).



Harald Nowotny

Paper Machines Graphic
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Success in South Africa – Mondi relies once more on Voith Paper

With a handshake, in February 2004 Voith Paper received a major order from Mondi Fine Paper South Africa to rebuild the PM 31 at the Merebank paper mill. The order volume amounts to 50 million Euro.

Mondi International is a subsidiary of AAPlc, which has major interests in South Africa, in the mining of precious and heavy metals, as well as forest products. AAPlc is also very active in these and other industrial fields throughout the world.

Mondi is one of the two largest paper producers in South Africa and operates there and in Europe with separate structures. However, this geographical structure will be changed into a product-related structure in the near future. Mondi Fine Paper will become responsible for graphic paper grades, and Mondi Packaging for the board and packaging grade divisions – these two are forming Mondi International.

The uncoated wood free paper grades at the paper mill in Merebank together with the Richards Bay pulp mill will, in future, form part of a new division known as Mondi Fine Paper South Africa. Similarly the paper mills of the Neusiedler Group in Austria, Hungary, Slovak Republic, Rus-

sia and Israel will become the European arm of Mondi Fine Paper.

The production of cardboard, packing, kraft and corrugated papers as well as converting and the recycled paper businesses will be allocated to the new division Mondi Packaging and includes Frantschach AG and Frantschach Packing as well as the paper mills in Austria, Switzerland, Italy, Poland and China which have recently been taken over from the Bauernfeind Group. The South African cardboard and packaging mills in Springs, Felixton, and Piet Retief will be incorporated into Mondi Packaging South Africa.

The PM 31 in Merebank, which currently produces magazine papers, is to be rebuilt and converted to produce uncoated, woodfree copy paper grades. During the projecting phase, various proposal discussions and meetings in South Africa, Vienna and Helsinki took place. Jaakko Pöyry had worked out the pre-feasibility study and the project invitation to tender.

In fact, this major rebuild nearly corresponds to a completely new paper machine. Only a few components were taken over from the old machine. The new PM will have a new wire width of 6,370 mm and produce 250,000 t/year of copy paper with a basis weight of 80 g/m² at an average operating speed of 1,300 m/min. The PM will be laid out for a design speed of 1,500 m/min.

The new PM is practically a follow-up order in the Mondi Group, because the concept for the PM 31 is nearly identical to the concept for the PM 18 in the Ruzomberok mill (Slovak Republic), which was started up successfully in September 2003. The Ruzomberok paper mill belongs to the Neusiedler Group which, in turn, is part of the Mondi Group.

For this unit, Voith will deliver a Master-Jet G headbox with ModuleJet dilution-water technology for best basis-weight distribution and fibre orientation. Excellent CD profiles can be expected with the Profilmatic M control concept. Lamellas

in the slice nozzle improve the turbulence characteristics, by which the paper structure is further optimized.

The DuoFormer TQv is responsible for excellent formation, a vertical former for higher operating speeds, symmetric dewatering and fast and safe wire and roll change.

The Voith press section, which consists of only one nip formed by a Single Nipco-Flex press, is the central part of the machine. This double-felted shoe press ensures a uniform sheet structure with highest dry content due to the homogeneous dewatering distribution. On the PM 18 in Ruzomberok, the runability proved to be excellent as well.

The CombiDuoRun dryer section is equipped with perforated paper rolls that are evacuated from the outside and located between the dryers and ProRelease stabilizers. This ensures best web release and efficiency. The ropeless transfer system is responsible for a safe and trouble-free paper tail transfer through the dryer section.

The SpeedFlow with free-jet size application follows the single-tier pre-dryer section. There will be no thermal deflection

due to the CRP beam design. Better operational efficiency with easy and quick exchange of the metering rods. The web run includes an Airturn system.

The new EcoCal Delta hard nip calender is designed such that it could be converted into an EcoSoft Delta soft nip calender at any time. The new calender will be equipped with a 32-zone Nipcorect roll for individually zone-controlled loading to achieve a perfect CD-profile. The Flexitherm roll is laid out for a future operation with thermo oil and a surface temperature of 150 °C.

A MasterReel provides best winding quality when winding up the paper. The linear load will be sensed directly via the load cell at the reel drum. This leads to a consequent separation of the linear-load generation and measurement and thus to a reproducible roll hardness structure without being influenced by disturbances in the loading system. The maximum winding diameter of the new MasterReel is 3,350 mm.

The contact less paper tail pick-up from the last pre-dryer to the SpeedFlow and from the last after dryer through the calender and reel is achieved with the proven Fibron vacuum technology and

high-pressure WaterJet tail cutter ensuring an optimal tail transfer process.

The order includes the hood and the air systems, steam & condensate system, mechanical drive, lubrication system as well as the C&I system for the paper machine.

Voith Paper will deliver the basic process engineering and supervise disassembly, pre-assembly and the main erection work. Voith is also responsible for start-up and training.

As a result of this extensive conversion of the paper machine, certain adaptation work is required in the stock preparation system, including appropriate basic engineering for the process and control and instrumentation.

In this connection, the ModuleJet dilution water supply system for the new headbox will be equipped with a VoithVac deaeration and a MultiScreen screening system. In addition, a total of five broke pulpers and two broke conveyors will be installed.

For the conversion of the paper machine, Merebank also relies on the process knowledge and application competence of Voith Paper Automation. In the future,

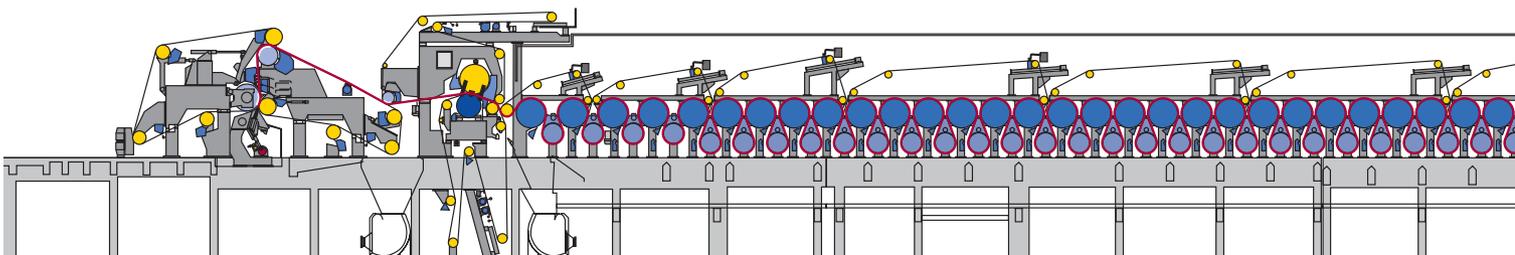


Fig. 1: The "Hand shake" between Casper Nice, Mondi Fine Paper South Africa, on the left and Andreas Endters, right.

Fig. 2: The teams of Mondi and Voith after order placement.

Fig. 3: PM 31 schematic.



the proven Profilmatic M system will control the cross profile at the headbox.

Voith Paper Automation also deliver FeltView, an innovation for the exact on-line supervision of the permeability, temperature and moisture of the used felts.

The EnviroScan will be used for the optimization of the press section and for the moisture CD profile control. It operates precisely and reliably under extreme conditions such as heat, dirt and high ambient moisture. With its integrated moisture-measuring head and a web-temperature measuring unit, it allows to eliminate process errors early on.

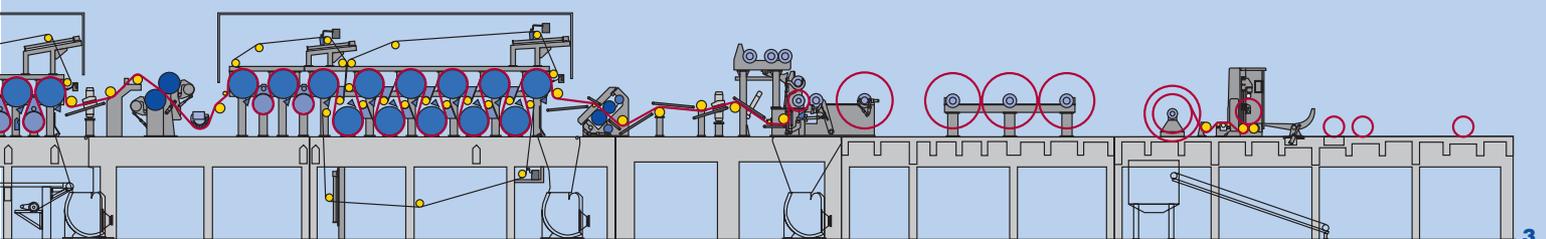
The existing paper machine will be shut down in May 2005, and the new machine will be started up in August 2005.

As a partner with process and service competence, Voith Paper has gained recognition by the South African paper industry. Interesting and demanding orders from this market area are the proof of this. We are particularly happy that we could also convince Merebank Paper Mill of our competence and that Voith was awarded with the PM 31 order.

The technical concept for the wet section and the dry section proposed by Voith Paper and the newly-developed Single

NipcoFlex press, which will be the state-of-the-art and trend-setting press concept for copy papers, were also decisive for this decision.

Mondi Fine Paper has the intention to perform some additional modifications of this line in the following months. They plan a new preparation line for eucalyptus, the extension of the existing vacuum system and a new slitter/winder. We will offer our confidential partnership for these projects as well.





Peninsular PM 62 Newsprint machine ordered

For their Papelera Peninsular mill in Madrid, Holmen Paper AB has ordered from Voith a complete new production line for standard newsprint.



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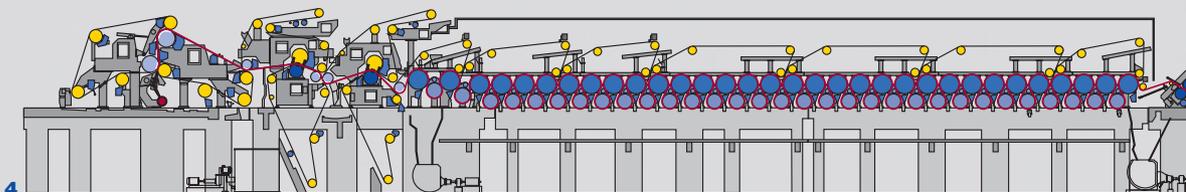
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The new line will substantially increase production capacity at Papelera Peninsular, which opened at its present site in 1998. In the year 2000, the mill was taken over by Holmen Paper, one of Sweden's largest paper producers. Today the mill produces mostly newsprint, along with MF magazine and lightly coated paper, all based on de-inked pulp.

The PM 62 is designed for producing 300,000 t.p.a. newsprint in the basis weight range of 40 to 49 g/m² from 100 % recovered paper. The wire width

will be 9,650 mm, the design speed 2,000 m/min. Together with the existing PM 61, which has already undergone successful rebuilds by Voith, the mill capacity will increase up to 470,000 t.p.a. Papelera Peninsular's leading position as supplier to European newspaper publishers will thus be strengthened further.

Apart from the actual paper machine, Voith is also supplying key components for the deinking line such as hole and slot screening, flotation and disperging.





A DuoFormer TQv will ensure excellent formation together with a MasterJet G headbox with ModuleJet and Profilmatic control systems. The Tandem NipcoFlex press with steam box and a transfer belt in the second nip ensures highest dry contents and optimum paper quality. The dryer section is fitted with the advanced TopDuoRun dryer technology and ModulePro moisturizers. The newsprint web then passes through an EcoSoft Delta softnip calender, before winding up with the trendsetting Sirius reel technology. Tail feeding through the whole line is done completely ropeless with proven Fibron vacuum technology. This high-tech processing line is rounded off with two VariFlex L winders and a LowPack roll wrapping line. Voith is also supplying

the entire PM automation system including CD and MD controls, moisture control by EnviroScan and monitoring systems.

The entire line is designed based on the “One Platform Concept” principle: all modules and components – from headbox to roll wrapping – are supplied by Voith and optimally balanced to meet all customer demands on quality and cost-effectiveness.

Decisive for placing this order with Voith were not only our outstanding process competence but in particular our vast experience and know-how in newsprint production from 100 % recovered paper. Voith is now the unchallenged world leader in paper recycling and complete newsprint production lines.

Commissioning of PM 62 at Papelera Peninsular is planned for the beginning of 2006.

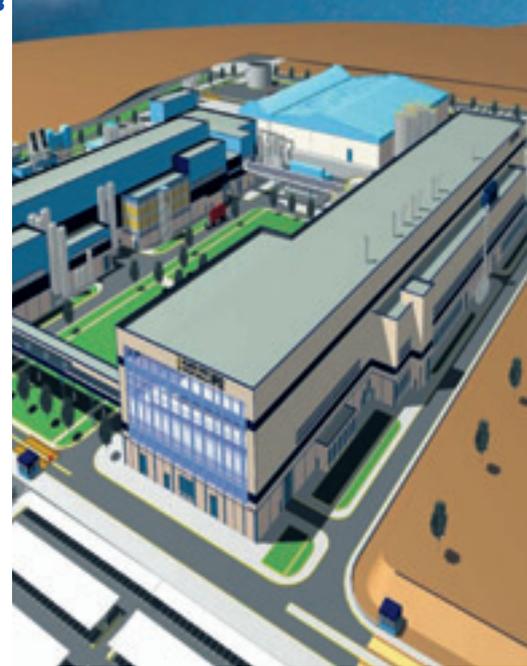
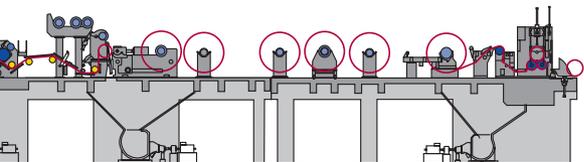
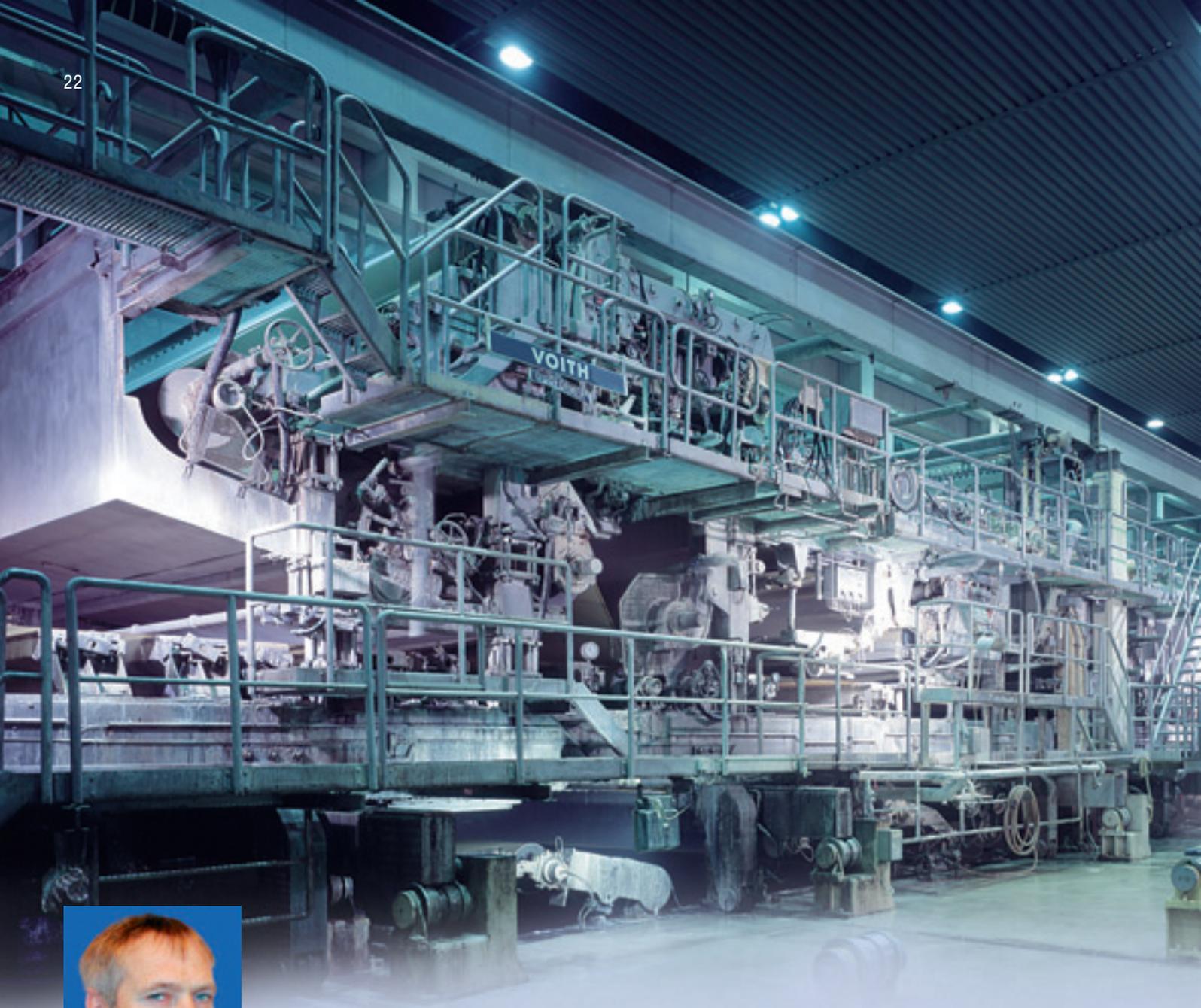


Fig. 1: Kurt Brandauer (Managing Director Voith Paper Heidenheim) and Arne Wallin (President Holmen Paper) signing the order.
Fig. 2: Members of both project teams after the signing ceremony.
Fig. 3: Holmen Paper Papelera Peninsular: the new paper machine hall.
Fig. 4: Schematic layout of PM 62.





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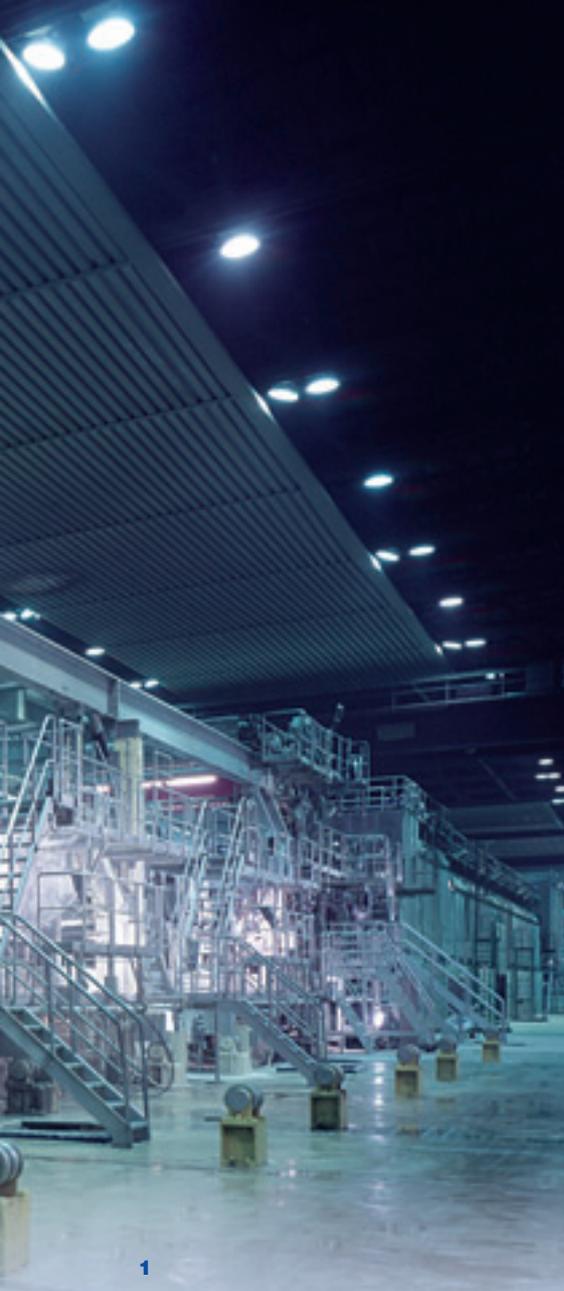


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Mission 2004 – Rebuild of StoraEnso’s Board Machine 3 at Baienfurt Mill

After a successful rebuild, BM 3 of Baienfurt Mill, Germany, was put back into operation on February 3, 2004. The rebuild of BM 3 is a crucial challenge of the “Mission 2004”, an ambitious large-scale investment project amounting to Euro 70 million. This rebuild helps to safeguard the Baienfurt location, being situated in the heart of Europe, on a long term basis, making it an efficient service and logistics center by boosting its production and processing capacities.



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Fig. 1: Board machine 3, StoraEnso, Baienfurt.

Fig. 2: On-line coater.

The rebuild carried out by Voith involved nearly all sections of BM 3. Special mention has to be made of the world's first installation of a NipcoFlex calender that met all expectations during the test phase and will replace the Yankee dryer in the long run. Thanks to the excellent teamwork and coordination of all companies concerned, the entire rebuild, from the shutdown of the machine till the first paper, was completed in no more than three and a half weeks.

The StoraEnso Group and Baienfurt Mill

StoraEnso is an integrated paper, packaging and forest products company and one

of the world's leading producers of writing and printing papers, as well as board. The group employs about 43,000 persons and is represented in more than 40 countries. The total production capacity amounts to approximately 15.7 million tons/year of paper and board.

The Baienfurt mill was established as early as 1871. Today, 450 employees produce approximately 210,000 tons of coated folding boxboard and 120,000 tons of groundwood. The coated folding boxboard in a basis weight range of 160-380 g/m² is used for packages of all kinds, e.g. for cosmetic products, drugs, foodstuff, cigarette boxes and for graphical applications, such as greeting cards, catalogues and book covers.

Fig. 3: An advanced technology – the new Voith NipcoFlex calender.

Fig. 4: The Sirius is used to ensure optimum winding quality.

Baienfurt is located in Southern Germany, near Lake Constance, right in the heart of Europe. This central position was the reason why StoraEnso decided to expand the processing capacities and establish a distribution center in Baienfurt. Close to the customers, orders for grades not produced at the Baienfurt mill can now be handled there at short notice.

Rebuild of Board Machine 3

The BM 3, a multiple fourdrinier machine with a wire width of 5,150 mm and a working speed of 610 m/min after the rebuild, was delivered in 1970 by Voith and has been modified ever since by several rebuilds. Over the years, the quality and quantity of production were continuously improved thanks to various measures.

After intensive negotiations, Voith received again the order for a major rebuild of the machine. Except for the wire section, all sections of the board machine were involved in the rebuild.

Voith's scope of supply basically comprised the following fields: The complete press section was dismantled, the reused framing parts were machined and adapted accordingly. Two new pick-up suction rolls and a double-felted NipcoFlex press (2nd press) were installed, leading to less free draws and nips.

An offset press was used as third press. The package also included a new press pulper, including drive, as well as the complete hydraulic and pneumatic and electric control systems.



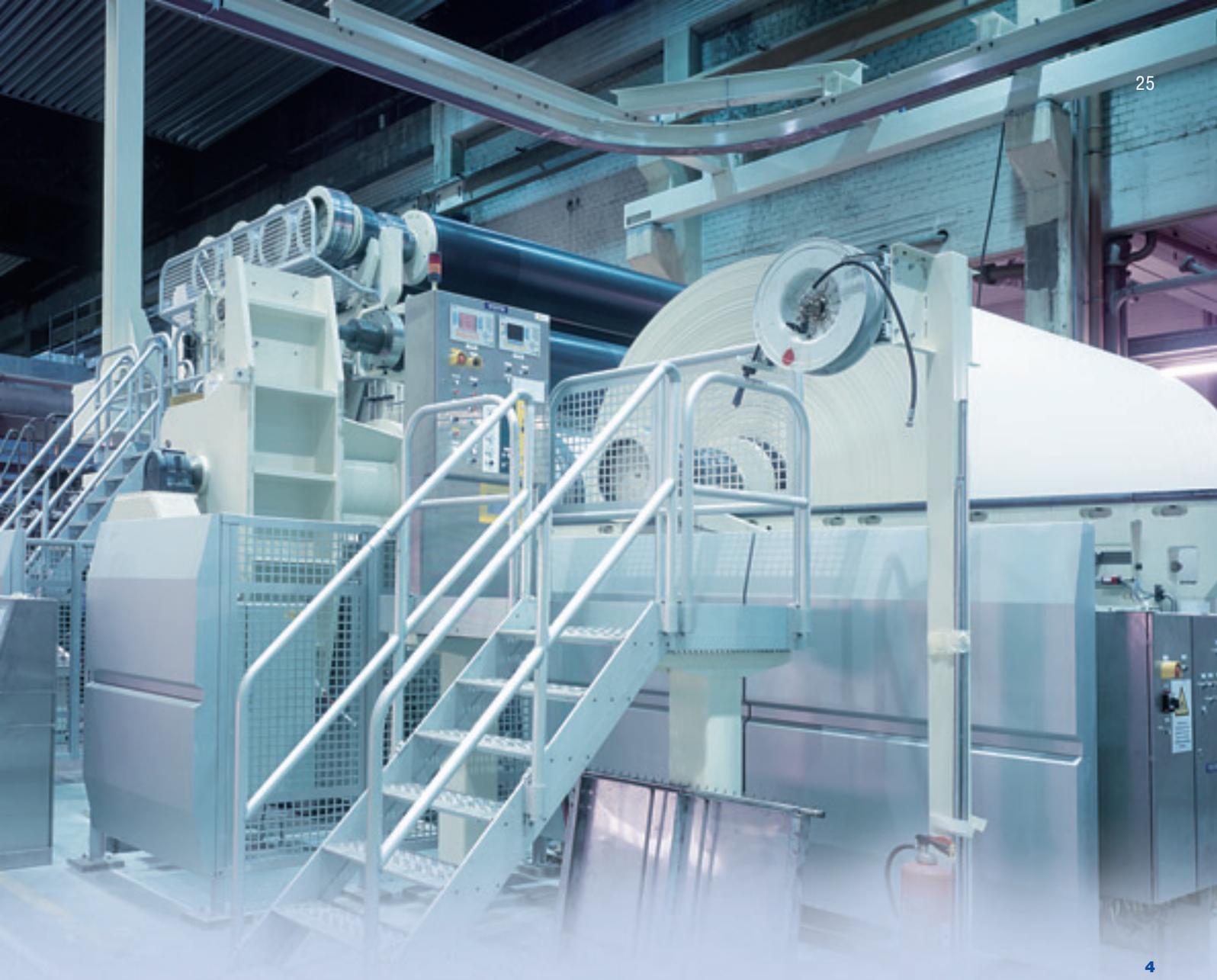
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The pre-dryer section was extended by two dryer groups with a total of 11 relocated and two new dryers. In addition, various parts for enlarging the steam and condensate system were delivered.

The „highlight“ of the rebuild of BM 3 was the installation of a wide nip calender named NipcoFlex calender. This unit is to replace the Yankee dryer to boost the production speed of BM 3, while enhancing the printability of the board at the same time.

Compared to conventional soft calendering, the NipcoFlex technology provides a longer nip dwell time of the web, thus using the effects of temperature and moisture gradient calendering so that the pressure can be reduced, resulting in more bulk while maintaining the surface



4

quality. On the other hand, the surface quality can be improved at equal bulk and bending stiffness by slightly increasing the pressure. The NipcoFlex calender smoothes the contours, i.e. micro-roughness (measured according to the PPS method) is improved much more than macro-roughness (measured according to the Bendtsen method).

Compared with the Yankee dryer, the NipcoFlex calender is far more superior. It smoothes the paper with less reduction in bulk than the Yankee dryer with its German Press and can be operated at much higher speeds than the Yankee dryer. Therefore, the Yankee dryer will soon be removed from BM 3.

The heated roll of the NipcoFlex calender of BM 3 can be operated with a surface

temperature of up to 250 °C. This is achieved through inductive heating from inside – oil heated systems cannot meet such requirements.

Since the beginning of 2002, highly extensive calendering, coating and printing tests were carried out in close cooperation with StoraEnso Baienfurt and Omya AG in order to develop the optimum operating parameters for this new calendering technology, including first printing tests with StoraEnso Baienfurt's customers, which led to very positive results. First production data show that the NipcoFlex calender comes up to the high expectations.

The after-dryer groups were extended to form a three-tier configuration. In total, three dryers were re-located and nine new dryers were installed.

Apart from that, the coaters were re-arranged, resulting in a new coating sequence and ensuring optimum web run. The gas-heated Krieger CB dryers installed downstream of the IR dryers were optimally adapted to StoraEnso Baienfurt's needs, while taking quality and energy efficiency aspects into account. In addition, the new Krieger HCB Turn is used, allowing simultaneous, non-contact web guiding and drying.

For winding, a new Sirius centerwind with RollMaster roll hardness control is installed, ensuring optimum roll hardness build-up of parent rolls with diameters up to 3,500 mm. The extensive scope of supply for this section includes: a magazine for empty reel spools, web cut-off device, parent roll conveying system with reel spool carriage for turning the parent



6



5 rolls, new unwind station for existing slitter-winder, magazine for empty reel spools and monorail for transporting the empty reel spools to the Sirius, as well as hydraulic, pneumatic and electric control systems.

Moreover, pivoted transfer systems, mechanical drives, as well as the complete installation and start-up were part of Voith's scope of supply.

The entire control system was realized on the Siemens process control platform PCS7, with Voith Paper Automation being responsible for the automatization of Voith Paper's scope of supply. Since the entire process control system was replaced, Siemens, having been commissioned by the customer, was responsible for all other machine parts on the same process control platform. Thanks to the very close cooperation with StoraEnso Baienfurt and Siemens, the control system was successfully put into operation.

Project Schedule

The very short shutdown and rebuild time scheduled for BM 3 required extensive pre-assembly work at the various Voith Paper locations. The parts that had been dismantled again after workshop assem-

bly were delivered to Baienfurt until end of 2003 in largest possible units and were stored as logistically appropriate. As early as October 2003, the pre-assembly of various parts was started while the machine was still running, such as e.g. the control units.

On January 6, BM 3 was shut down for the rebuild, as scheduled, and approximately three and a half weeks later, on February 1, 2004, 5 pm, the start-up and trial operation was initiated on schedule.

The smooth workflow and the coordination of all companies involved in the rebuild was ensured through daily meetings and constant checks based on the installation schedule drawn up jointly. Up to 500 fitters worked in day and night shifts to install the large Voith scope of supply. One of the reasons why work progressed so swiftly was the excellent cooperation with the Maintenance Department of StoraEnso Baienfurt. Another advantage was the closeness to Voith Ravensburg that provided rapid and flexible assistance if modifications or minor re-machining were required. After the start-up and trial operation, the machine was taken over by StoraEnso Baienfurt on March 4, 2004. Voith congratulates StoraEnso Baienfurt on the successful start-up of BM 3.

Fig. 5: Sirius operating desk.

Fig. 6: Krieger CB dryer, in the front; Krieger HCB Turn, in the back.



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To the customer's advantage – From One Platform Concept to Process Line Package

Ever since its introduction, the Voith One Platform Concept (OPC) has been systematically developed for even greater customer benefit. More than twenty new paper machines for almost every grade of paper have been built and delivered on the OPC principle. Originally the One Platform Concept covered the paper machine from headbox to reel. As a second step it was extended at both ends to include stock preparation and roll packaging. And in the latest stage all the auxiliaries contributing to the papermaking process have also been integrated in this concept.

Current status of the One Platform Concept

Today all Voith paper machines are designed and built according to the One Platform Concept. For each paper grade Voith offers under the One Platform Concept a standard production line layout in which all the modules including headbox, wire section, press section, dry section, calender, coater, reel and winder are optimally adjusted to each other. Apart from these modules, custom-tailored components such as roll covers, fabrics and above all intelligent automation systems ensure that all process requirements are optimally fulfilled.

The One Platform Concept is innovative, well proven and customized. Its purposes

and goals can be summed up as: Quality tons on the reel!

Further development of the One Platform Concept

The experience gained on numerous complex plants has shown again and again that not only a perfectly functioning paper machine, but above all the perfect design, balancing and dependability of all auxiliaries is decisive for production quality. For papermaking lines it is indeed very true that a chain is only as strong as its weakest link.

As a result, standardization efforts recently focused intensively on the auxiliaries as well. For example air technology

systems, vacuum systems and electrical drives are key components of a production line.

Although these are not original Voith products, the One Platform Concept with its standardized interfaces is ideal for integrating subcontractors' products as well.

One Platform Concept and Process Line Package

In order to extend the advantages of the One Platform Concept to auxiliaries as well, Voith has developed the **Process Line Package** concept.

Voith is world famous for first class paper machines. To most people that means

a combination of dependable machinery and sophisticated technology. But this is only one aspect of Voith's performance. For complex plants another factor is increasingly important – professional project management. To ensure that all components mesh together like the pinions in a gearbox, the entire project has to be in one pair of hands.

Voith's new Process Line Package (PLP) concept is the perfect way to handle complex projects **fast** and **efficiently**, at **low risk** and **cost-effectively**.

Market requirements

The paper industry today is more affected than ever by the rising costs of raw materials, energy and human resources. At the same time, earnings on paper products have flattened off. This means that cost-effective investments must not be higher than they were five years ago, for example.

New production lines today can cost up to 500 million Euro. Such large investments are challenging even for large international corporations. They cannot afford any errors which might endanger production startup, paper quality or output, so they generally choose only well-proven processes and technologies.

Furthermore, a good many paper mills have reduced their design and planning

staff to a minimum in recent years, so that only everyday tasks can be handled. For large projects they lack the necessary specialists and above all the project management experience required. With a hundred suppliers or more involved in large projects,

- Who coordinates them?
- Who carries the responsibility?
- Who ensures success?

Possible solutions

For paper mills without their own project engineers there are two alternatives: either recruit specialists or delegate the project to a consulting firm. Both solutions have their advantages and drawbacks, which have to be carefully evaluated according to project. In both cases, however, nobody takes overall responsibility for plant operation as a whole. For this, a general contractor is required.

A general contractor is able to take overall project responsibility, but normally with such insignificant value-added that risks can only be covered by appropriate provisions and margins. This increases investment costs without adding value accordingly.

Only the supplier of the paper machine, which always represents the greater part of the investment, can take overall

process responsibility – provided that they are directly in charge of all the key components. Thanks to the experience and findings gained from numerous projects, they can precisely formulate the requirements on subcontractors and take overall responsibility without any additional risk.

This systematic project management approach, perfected by Voith during the course of several years, is called the Process Line Package.

Process Line Package

Definition

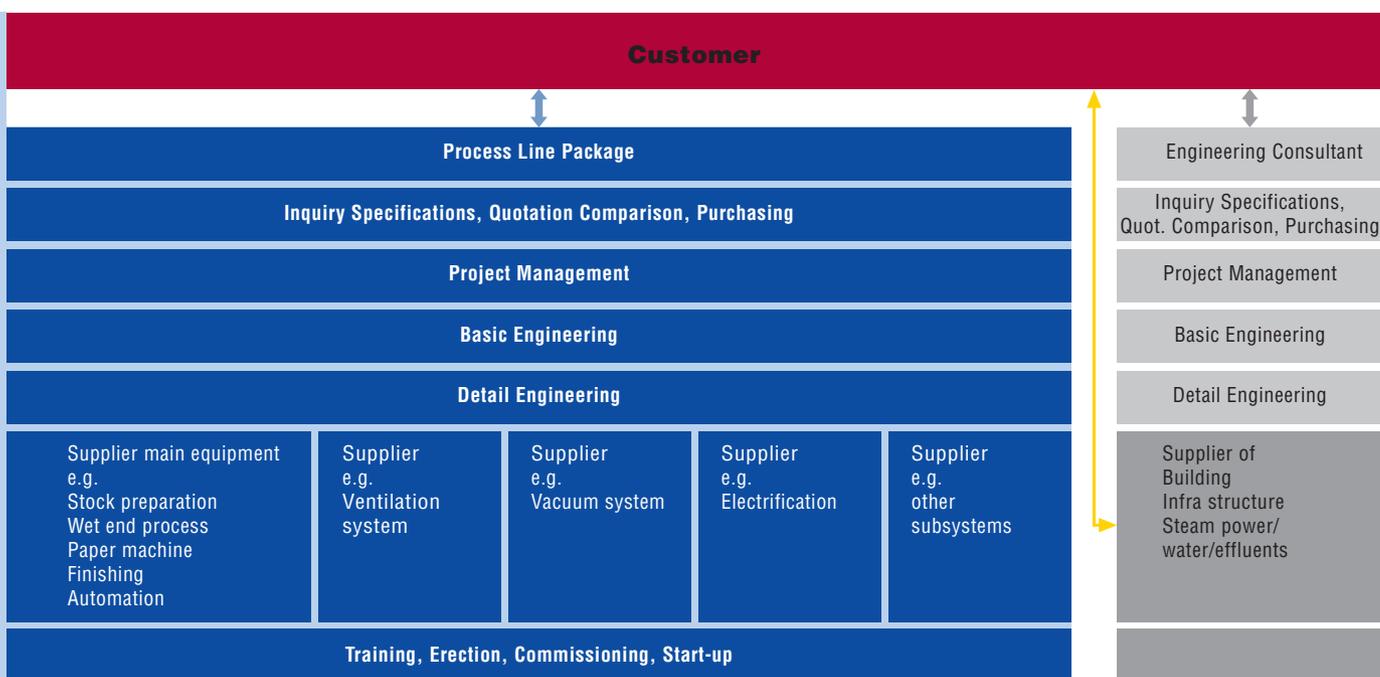
With the Process Line Package the paper machine supplier provides design, procurement and erection supervision services for all line components influencing the papermaking process.

Extent

The papermaking process line includes all relevant line components, ranging from stock preparation and additives systems, to the paper machine and finishing processes including roll packaging. It also covers subsystems such as air technology, electrical power and automation, as well as the auxiliary systems.

Explicitly excluded are generally the mill buildings, power plant, water treatment and logistics.

Fig. 1: Process Line Package – all out of one hand (100% PLP).



The PLP offer phase

Voith first draws up with the customer a requirements catalogue (project specification), then prepares a comprehensive offer covering all PLP elements.

Voith also procures the necessary subcontractor offers and integrates them into the overall tender.

To ensure competitive offers, requirements on subcontractors must be precisely formulated. This is a particular strength of Voith, that knows the optimal interplay of subsystems within the Voith process line and can therefore select the optimal subcontractors (both with regard to price and quality).

PLP flexibility

Voith offers two commercial PLP versions:

- Voith takes over the entire PLP and supplies all auxiliaries, ensuring thereby competitive subcontractor offers. In other words: Voith is the buyer and seller (Fig. 1).
- Voith compiles the subcontractor specifications and procures their offers. The customer decides whether to buy some line components directly, but must take account of the requirements placed by Voith on the subcontractors. Subject to this condition, the customer can assign overall responsibility to Voith, who is paid a risk surcharge (Fig. 2).

PLP in practice

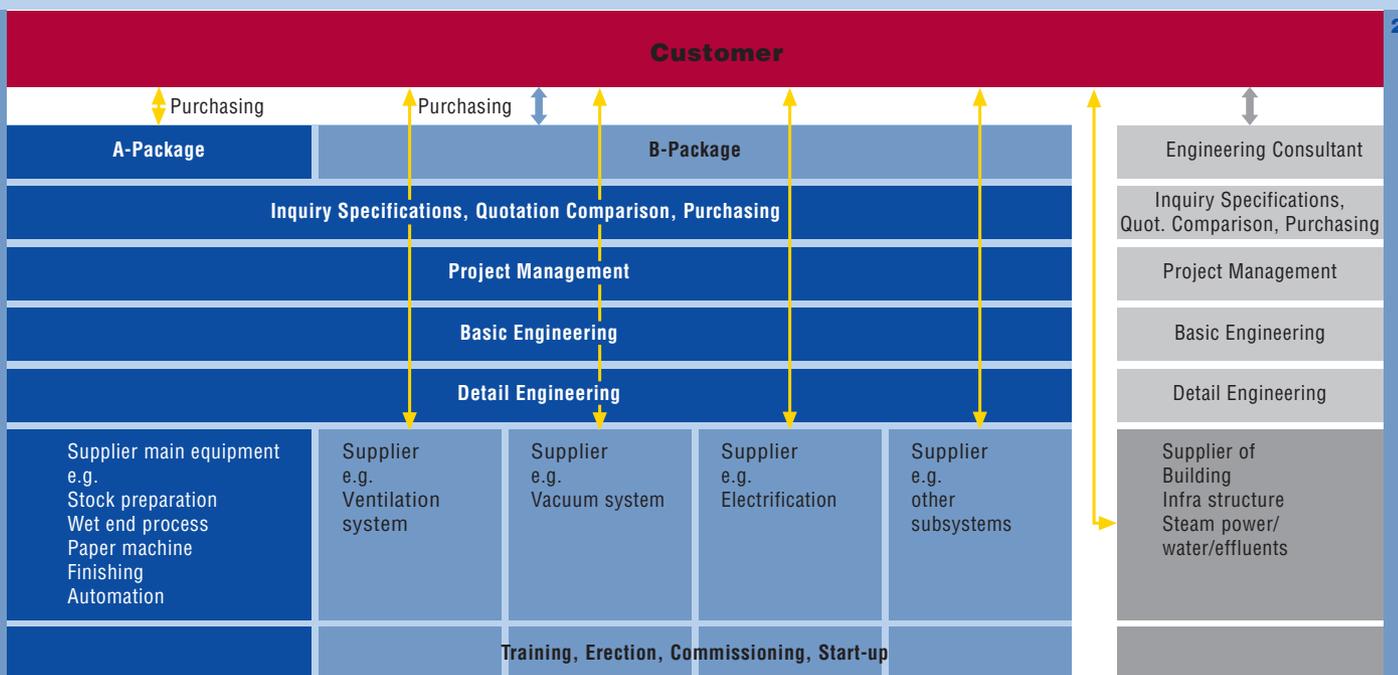
Voith takes overall responsibility for project management, scheduling, erection, commissioning and subsequent optimization. The customer, therefore, has only one partner to deal with, that is responsible for the entire line.

PLP guarantees

Voith takes responsibility for the completeness and correct operation of the components and systems supplied. In particular, Voith guarantees:

- the completeness of all PLP components
- compliance with the time schedule
- compliance with process quality and capacity requirements.

Fig. 2: Process Line Package with a B-Package portion.



PLP advantages

Overall responsibility of the PLP partner **minimizes interfaces** for the customer, who must no longer consider supply limits and responsibilities within the PLP. This reduces discussion time and **speeds up the project**.

The continuous standardization, which led to the Voith One Platform Concept, can now be extended to the auxiliaries as well. This brings further **cost savings** and **minimizes risks** by using only well-proven equipment.

Voith spends about 5% of earnings on research and development. Extension of the One Platform Concept to the auxiliaries

enables **further development** of these components as well.

PLP project experience

Project completion times of 13 months (from receipt of order to first paper on reel) and world record production outputs only three months after commissioning (Dagang) are outstanding examples of successful PLP projects.

Feedback received from customers that ordered Voith PLP projects have always been positive, thus confirming that PLP projecting is the way to go in future.

Voith Paper Heidenheim handles about three PLP projects every year. The experience

gained thereby by Voith and its people is the best guarantee for ongoing project success.

By the way: the Process Line Package principle is also used for rebuilds. This lets the customer complete a complex rebuild quickly, reliably and successfully with only one partner.

Customer statement

"With PLP we already know before commissioning how much the project will cost. With traditional project handling, the costs are only apparent when it is too late to do anything about them."



Ruzomberok PM 18 – First Single NipcoFlex Press operating successfully

1



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In upcoming Slovakia, which became a member of the European Union in May 2004, Neusiedler SCP (Severoslovenské Celulóžky a Papiérne a.s.), part of the Neusiedler AG Group, decided to make a trend-setting investment. To boost the performance and quality of PM 18, a technology hitherto unique in Europe was used for the first time. Neusiedler SCP placed its trust in Voith Paper for the realization of this project and awarded the order in September 2002.



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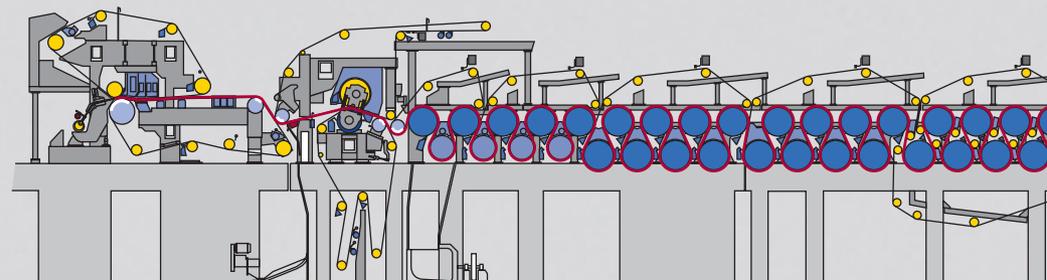


Fig. 1: The rebuilt PM 18 of SCP, Severoslovenské Celulóžky a Papierne a.s., Ruzomberok, Slovakia.

Fig. 2: DuoFormer TQm.

Fig. 3: Schematic of PM 18.

2



Otto Pichler

**CEO
Neusiedler-
SCP**



“We had expected starting problems with the press, but it turned out that the press was no problem at all. We are all very glad that we can operate the machine at such a high speed level at this early stage – this also shows that our choice of supplier was the right one.”

Ruzomberok is located in Slovakia in the mountain range of the Low and High Tatra. The woody Liptovsky region is a tourist attraction and offers not only thermal springs but also many leisure time activities from hiking to skiing.

Neusiedler SCP operates three paper machines for woodfree graphic paper at the Ruzomberok location and is the largest company in the paper industry in Slovakia.

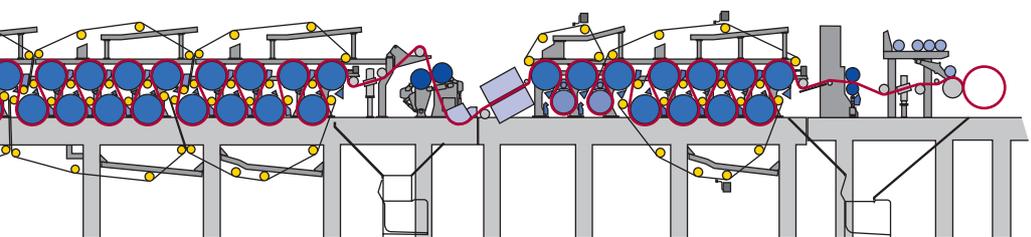
Rebuild goals

PM 18, which originally went into operation in 1990, produces copy papers with a basis weight of 80 g/m². The trim width of the machine is 6,550 mm at the reel. The pulp required for this is usually produced in the company’s own, integrated pulp mill.

The production capacity of the paper machine will be boosted by the “Impuls 18”

project to 290,000 t/a. To achieve this ambitious goal, the machine is designed for a maximum production speed of 1,400 m/min.

After intensive discussions and extensive series of trials on the research equipment of Voith Paper, the newly developed Single NipcoFlex Press Concept has proven to be the best solution in the area of the press section. From the fiber to the paper, complete series of trials have been conducted with studies of the virgin fiber concept, the paper machine and its clothing and calender technology. The pilot trials were a part of the extensive risk management, with the goal of recognizing obstacles in time and counteracting them on the way to fulfilling performance and quality. In several stages, experience gained from other mills was transferred,



3



existing machine sections analyzed, measuring techniques developed and measures taken or alternative solutions worked out not only prior to award of the order but also during the project work.

The technology

For the high speed, the installation of a gapformer was imperative. To obtain the best formation values, low two-sidedness and a high drainage capacity, a horizontal **DuoFormer TQm** with the mill-proven modules, foil section after the forming roll and loadable forming strips (top-wire suction box) has been selected. This type of former is an ideal rebuild solution, as it makes it possible to take over existing machine parts. Good basis weight profiles and fiber orientation are ensured by the **MasterJet II G** headbox with the well-known **ModuleJet** dilution water technology.

The **Single NipcoFlex Press** with its double-felted shoe press guarantees a uniform sheet structure by homogeneous drainage distribution. With its large pressure shoe, the ideal compromise for high caliper values for the paper, accompanied

by optimal dryness values after the press, is achieved.

The Voith **QualiFlex** shoe press sleeve in operation ensures an optimal dewatering capacity throughout the service life.

The pre-dryer section of PM 18 has been rebuilt with a **DryStar** rebuild into a single-tier section with **DuoStabilizers** inclusive of **ProRelease** zones and a two-tier section with ropeless threading. An **EnviroScan** measuring system is installed directly at the beginning of the dryer section for the evaluation of the moisture profiles and for control of the **ModuleSteam** blow box. To increase the drying capacity in the after-dryer section and for a good web run, an Airturn and a float dryer are integrated after the Speed-Sizer.

Machine clothing from Voith Fabrics also contributes to the success of the production line. This was ordered for all sections.

A major part of the scope of supply is the new **VariFlex L** two-drum winder from Voith Paper Jagenberg with a maximum operating speed of 2,500 m/min. The

winder is equipped with a Flying Splice unit and the precise TruSet slitter positioning system and allows a roll changing time of only 30 seconds.

The results

On September 25, 2003, paper was produced for the first time with the new PM 18 at a speed of 1,050 m/min at the reel. After reaching the quality goals, the machine speed was continuously increased within a few weeks to an operating speed of 1,300 m/min (**Fig. 8**). In April 2004 the maximum operating speed of 1,400 m/min has been achieved on a continuous basis.

With the installed DuoFormer TQm, very good formation values were reached shortly after start-up. As **Fig. 9** shows, it is important to have high water rates at the strips after the forming roll, where the loadable forming strips also work.

Start-up of the first Single NipcoFlex press section is a special highlight both for Neusiedler SCP and Voith. This technology, which is being used in Europe for the first time for the production of wood-

Fig. 4: Quality tons on the reel.

Fig. 5: The start-up team.

Fig. 6: SpeedSizer.

Fig. 7: Single NipcoFlex Press.

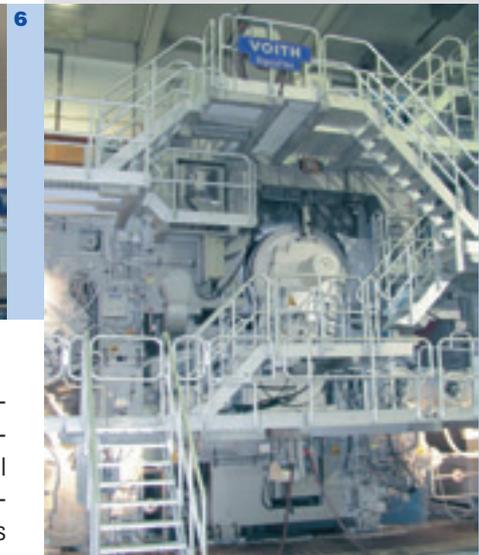
Fig. 8: Machine speed development.

Fig. 9: Formation versus drainage foil section after forming roll.

Fig. 10: Average dryness after the press section 52.2 % with 48 measurements.

Technical datas Single NipcoFlex

Operating speed	1,250-1,400 m/min
Operating line load	1,050-1,150 kN/m
Dryness after press	Ø 52 % (18 % filler/without steam box)
Dewatering ratio	~ 1:1 top:bottom
Two-Sidedness	Ø 0 % (average of 533 reels)
Roughness	Range: ± 15 %
Bulk and Roughness	Ø 1.31 cm/g at 220 ml/min roughness Bendtsen (average of 533 reels)



free uncoated papers with only one single, double-felted shoe press is an ideal press concept both with regard to capital and operating costs. Advantages, such as low space requirements and low consumption of utilities (electricity, water, vacuum), the omission of ceramic rolls with doctors, a closed web run or equal-sided paper structure, are obvious.

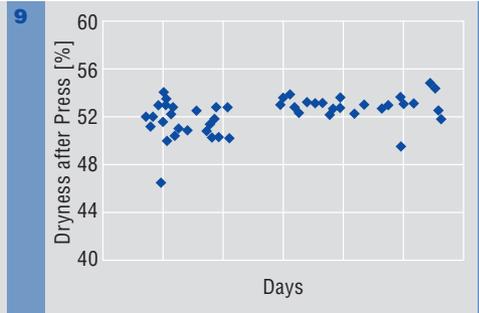
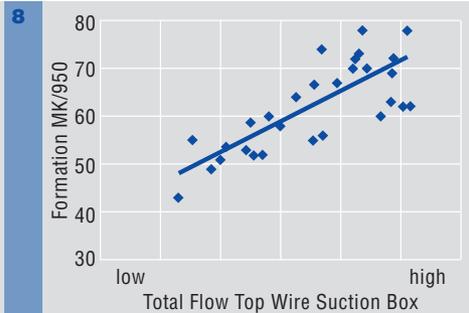
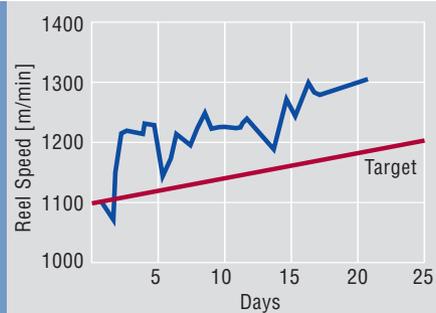
In Ruzomberok PM 18 this technology does, however, come into a performance class that goes far beyond the existing one – and this with great success.

All dryness values measured up to now after the press section, with an average value of more than 52 %, are distinctly above expectations (Fig. 10).

At the same time, the paper that is produced also meets high qualitative demands. Due to the very symmetrical drainage, a good sheet structure in z direction and equal-sided paper surfaces are produced. In a monthly average, two-sidedness of the roughness can be around 0 % and also the fluctuation width can be considered good at max. 30 ml/min difference between top and bottom side, at 220 ml/min Bendtsen roughness level. In relation to the very high dryness values, the specific bulk of the produced paper can be rated positive. With the over 300-mm-long hydrodynamic pressure shoe with the pressure development profile tuned specially to wood-free papers, the ideal compromise is reached between high caliper values for

the paper with simultaneously optimal dryness values after the press.

The newly developed Single NipcoFlex Press Concept start-up was excellent. Together with the customer, Voith will continuously further develop this machine.





Schongau PM 9 success story – Optimization completed



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Producing SC magazine grades from 100% recovered paper is a challenging task not only for the mill operator but also for the system supplier. Here again, Voith Paper is the global market leader.

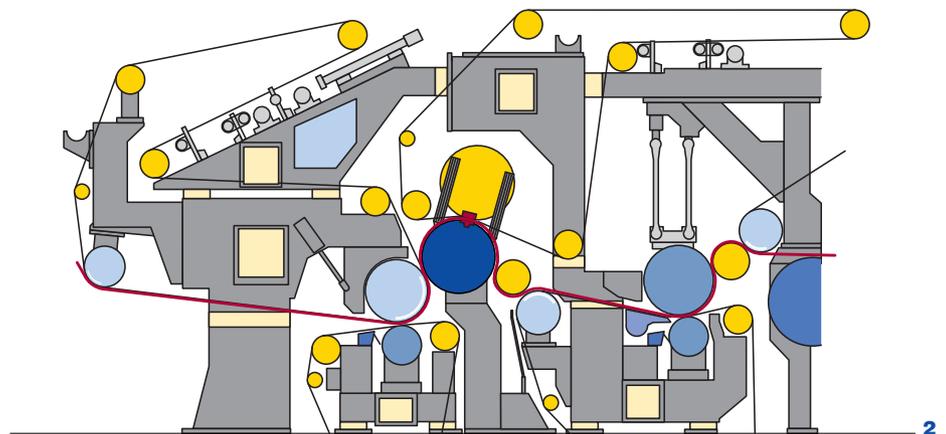
In order to produce first-class roto-gravure printing grades from 100 % recovered paper, PM 9 at the UPM-Kymmene mill in Schongau has been further optimized with a press rebuild. This rebuild involved installing a Duo-Centri-NipcoFlex press with 4th press – a Voith “One Platform Concept” module. At

the same time stock homogeneity was significantly improved by extending the approach flow section screens.

The result of all this optimization work, which was completed in only six weeks, was extremely good runnability almost immediately after recommissioning.



After optimization, the paper surface quality at unchanged basis weight (52 g/m²) is much smoother both visually and as measured. There is also a significant reduction of blackening, and the moisture profiles are excellent. In general the rotogravure printing quality on UPM-Kymmene Schongau paper is now much



better with regard to the critical criteria of missing dots and quiet press running.

The overall machine efficiency is well above that of comparable machines at an average speed of 1,521 m/min. As against the neighbouring PM 6, the optimized PM 9 produces considerably better paper at a speed 300 m/min higher.

This successful rebuild is largely thanks to the first-class teamwork and outstanding commitment of everyone involved in the project. Once again, Voith has stood by its word and kept all promises.

Summary of customer statements:

“Overall results are excellent. All the project goals were reached. Rotogravure printability is now highly acceptable, and printing press running qualities with this paper are outstandingly good. The paper machine runnability at a speed of 1,520 m/min exceeds our expectations.”

**Dipl.-Ing.
Artur
Stöckler**

**Vice President
and General
Manager**



“We sincerely thank Voith for their excellent teamwork in optimizing our PM 9. The machine startup was outstandingly good, and product quality has been at the very highest level ever since. Voith carried out the entire operation extremely professionally.”

Fig. 1: DuoCentri-NipcoFlex press.

Fig. 2: Schematic layout of the DuoCentri-NipcoFlex press.



Minfeng PM 21 – Specialist for specialty papers

Minfeng Special Paper located in Jiaying City in the Zhejiang Province is a highly developed production center for specialty papers in China. Minfeng is continually seeking new challenges. Following PM 18 for cigarette papers, supplied by Voith, Minfeng now wants to open up lasting new markets for label and inkjet papers.



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Minfeng and Voith partnership

Mainly in the field of specialty papers, a customer needs not only an experienced machine builder, but also a technology partner who can contribute his know-how as early as in the planning phase and pave the way for a smooth start-up. In the optimization phase the customer receives further support in order to ensure a steep start-up curve.

Minfeng has recognized how important the qualification of the partner is for such a project and that two important factors decide on the success or not of a project.

- A well thought-out machine concept that represents the basis for an

effective production process through innovative and at the same time well-proven components.

- Sound technological know-how, through which the possibilities of the optimal machine concept can fully come to bear.

If these two prerequisites come together, optimal quality and efficiency are achieved in paper production in order to be able to exist for a long time in the sales markets.

Voith has these prerequisites and, together with Minfeng, successfully implemented past projects. Minfeng, therefore, decided on purchasing this new machine again from Voith. Voith is not only a



Fig. 1: Minfeng Special Paper in Jiaxing City, Zhejiang Province, China.

Fig. 2: PM 21 machine house; foreground TwinFlo refiners of the long and short fibre line.

Fig. 3: EcoMizer cleaner stage.

renowned supplier of large machines for the production of mass-produced papers, but also for specialty papers with references for the most important specialty paper grades.

The complete production line (PM 21) for label and inkjet papers ordered in March 2002 went into operation at the end of 2003 and has more than doubled the production capacity of Minfeng. With this, Minfeng has been able to further expand its market position as one of the most important producers of specialty papers in China. In the year in which the Minfeng Group celebrates its 80th anniversary, the new machine represents a wonderful anniversary present.

The scope of supply

Voith's scope of supply and responsibility covered the complete production line from stock preparation to the reel, including an online coater, various ancillary units and broke preparation. In addition, Voith supplied a VariFlex winder.

System engineering, installation and start-up supervision as well as C&I hardware supplies and automation technology services completed the scope of supply.

In the **stock preparation** and **approach flow systems**, mainly proven components the customer was already familiar with from PM 18 have been installed:

- VS26 pulpers for the slushing of long and short fibre stock, TwinFlo refining and HCC high density cleaning.
- In the approach flow system, proven EcoMizer cleaner technology and Multi-Screen screening with C-bar screen baskets are used. Together with the ComMix and HydroMix components, a modern Wet End Process (WEP) is ensured. These components make sure that a very homogeneous stock suspension is fed to the paper machine.

The **paper machine** is based on the One Platform Concept.

The MasterJet headbox with ModuleJet dilution water technology ensures a uni-



form distribution of the stock across the machine width and enables the paper-maker to make reliable CD basis weight profile corrections. In addition, fiber orientation can be controlled via the adjustable slice blade.

The wire section consists of a fourdrinier wire with the two proven components, DuoFormer D and DuoShake, with which the high demands regarding formation and MD/CD tensile ratio can be ensured. The DuoFormer D is regarded worldwide as a reference for excellent formation. The DuoShake, a reaction-free shake, which is unique on the market additionally improves fiber distribution.

The Combi-2 press with EcoNip roll and a closed web run after the wire section up to after the second press nip is familiar to Minfeng from PM 18. The succeeding bottom felted straight-through press is used to minimize two-sidedness and to increase the dryness.

The pre-dryer section in CombiDuoRun design, equipped with DuoStabi rolls and web stabilizers as well as the ropeless threading system contribute to improved machine efficiency.

Ahead of the SpeedSizer is a hard-nip calender with water-heated rolls to pre-treat the paper surface for improved coating quality. On the SpeedSizer, both size and coating colors of different rheol-



ogy can be applied. It is precisely on different grades that the machine shows how flexible it is. After the SpeedSizer, an Airturn and a steam-heated air-float dryer are arranged.

Following the after-dryer group, equipped with a chrome-plated first dryer and a standard rope run, is a 2x2-roll EcoSoft calender with oil-heated rolls. On this calender, a roll stack can be reversed in order to be able to produce one-sided smooth label papers.

The proven horizontal reel ensures excellent rewind quality up to a diameter of 2,500 mm.

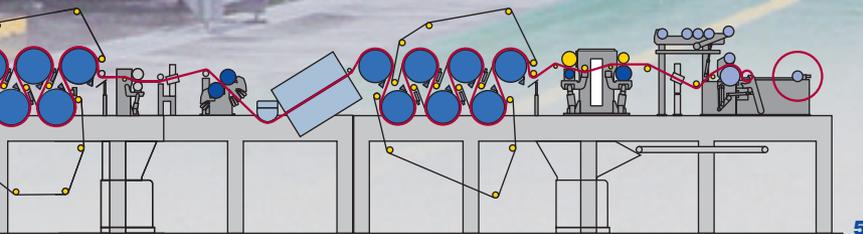
The reliable VariFlex winder at the end of the production line is a guarantor for excellent slitting and winding quality at high speeds.

In addition, Voith is responsible for the broke preparation system and various ancillary systems.

The project team

Besides the machine concept and technological know-how, the cooperation between the project teams of Minfeng and Voith was a decisive factor for the success of the PM 21 project. Putting to-





Technical specifications

Paper grades	Label and inkjet papers
Basis weight range	40-115 g/m ²
Wire width	4,150 mm
Design speed	1,000 m/min
Production capacity	185 t/24 h (gross)

gether project teams on both sides with persons that were in part already familiar with PM 18 created a very good climate of trust and cooperation from the beginning.

Great significance was given to the interpersonal aspects in consideration of the cultural differences between the two sides. The cooperation between Minfeng Special Paper and Voith can be considered an example of successful intercultural communication.

Installation and start-up

During the installation work, which lasted from March to October 2003 and with

several weeks at temperatures of more than 50°C inside the paper machine room, cooperation with the customer and the customer’s contractors was exemplary.

Overlapping with the end phase of the installation, the individual checks began and the start-up phase followed seamlessly.

The customer’s own start-up team specially selected for this project, which was thoroughly trained by Voith both in Germany and on site, worked with our start-up specialists so effectively together that the agreed start-up date was met and the

subsequent test run could be brought to a successful conclusion in February 2004.

Outlook

At present Minfeng is optimizing its production range in order to be able to make the demanded paper grades available on the market in first-class quality.

It is intended to carry out the warranty run by the end of June 2004. The handling of this PM 21 project followed seamlessly the well performing installation of the Voith supplied PM 18.



8

Figs. 4 and 5: PM 21.

Fig. 6: DuoFormer D.

Fig. 7: VariFlex RSM winder.

Fig. 8: Customer’s projectteam with both Voith projectmanager.

QualiFlex Press Sleeves – Innovative development of shoe press sleeves

The users of shoe presses expect long press sleeve service life, enabling planned sleeve changes to be made at pre-determined times. In addition, papermakers are interested in obtaining constant results throughout the service life period. These expectations have been met by Voith's innovative developments.

Over the past few years, the development of the QualiFlex Press sleeve has been significantly influenced by the development of the polyurethane matrix material. The goal was to further increase the service life of the sleeve by reducing the tendency to crack formation. This was accompanied by the improvement in mechanical wear and chemical resistance.

The goal was to achieve, above all, the technological properties such as a high dryness and uniform moisture profiles after the press and this over as long a sleeve service life as possible. This required to find materials with low abrasion values and simultaneously high stability of the groove geometry. Added to this was an optimization of the necessary void volume and the open area.

Below, a comparison is made between three material grades. The QualiFlex Q is our standard type, as it was originally introduced in the market and ultimately is also the reason for the success of QualiFlex Press sleeves. Above all in blind-drilled version, the QualiFlex Q still renders reliable service today in the appropriate application areas. The QualiFlex QX consists of a newly developed polyurethane grade, which has meanwhile proven popular for grooved press sleeves due to its wear strength. With the QualiFlex QV a further development is available which is currently being tried out in practice.

In the laboratory the material properties of the individual PUR grades can be quantified by a series of comparative analyses. Material samples with a small cut



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Fig. 1: Crack growth of different QualiFlex material grades in mm after 1 Million bending changes. QX and QV show 60%-70% lower crack growth compared to standard Q.

Fig. 2: Improved wear resistance through new QualiFlex material grades. QX and QV have a 50% lower abrasion compared to standard Q and 35% less swelling.

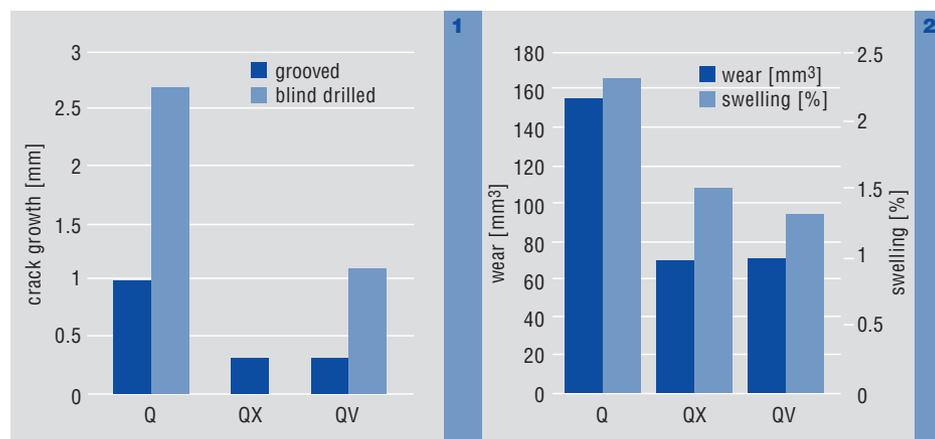
Fig. 3: Comparison of different materials new/old on an SC paper machine.

are tested for bending-change strength in more than one million cycles at a frequency of 7.5 Hz. After that, the crack growth is measured. The results are shown in **Fig. 1**. The difference between the further developed QX and QV sleeves and the standard product Q can clearly be seen. Crack growth is 60 to 70 % less. The QualiFlex QX is available only in a grooved version out of production reasons. The QualiFlex QV however will also be delivered blind drilled.

A further confirmation of the excellent material properties of the new developments is provided by the standardized material tests of abrasion and swelling, see **Fig. 2**. Both the QualiFlex QX and also the QualiFlex QV display a 50 % lower abrasion with at the same time 35 % reduced swelling in the water. This leads to improved chemical resistance accompanied by a higher resistance to wear.

These insights from the development work were in the meantime consequently implemented in results in the marketplace. The comparison of returned samples of press sleeves that have run proves the wear resistance of the QualiFlex in an impressive way. All three representations in **Fig. 3** show the identical groove geometry F12N with 34 % open area and 260 ml/m² void volume.

Fig. 4 shows how, through the use of a QualiFlex Q sleeve in a SC paper machine,



the high dryness could be maintained throughout the total sleeve service life. It is quite apparent that the QualiFlex QX ensured constant dewatering over several periods of felt life. At the same time, the QualiFlex Press sleeves constantly reached twice the life of all competitors on this reference machine, resulting in appreciable economic advantages for the producer through reduced shutdown costs.

The influence of a stable groove geometry on the dryness in a paper machine is shown in **Fig. 5**. The dryness with the corresponding, remaining void volumes of the two press sleeves were recorded at the time of the installation and removal. The analysis of the existing data on this paper machine revealed that, due to the extremely low wear of QualiFlex over the entire service life of the press sleeve, a constantly high void volume is available.

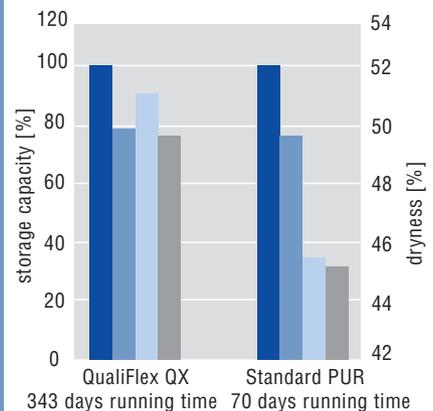
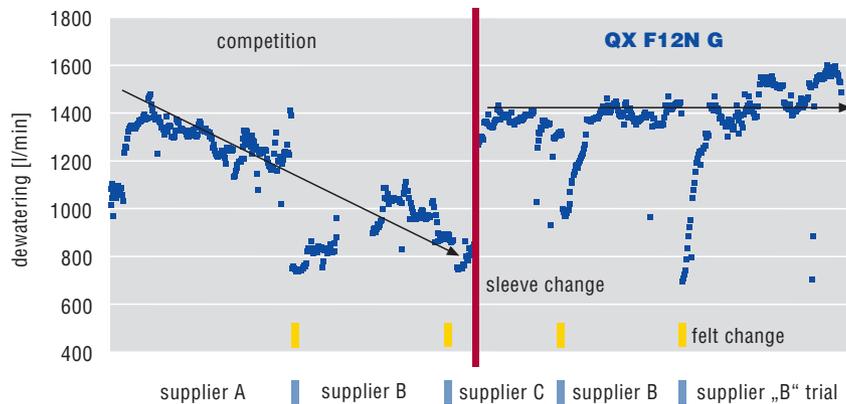


Fig. 4: Comparison of dewatering rates, competition – QualiFlex. NipcoFlex – EcoFlow dates.

Fig. 5: Influence of the void volume on dryness.

- Volume at installation
- Volume at removal
- Dryness at installation
- Dryness at removal

Fig. 6: Comparison of groove geometry under load.



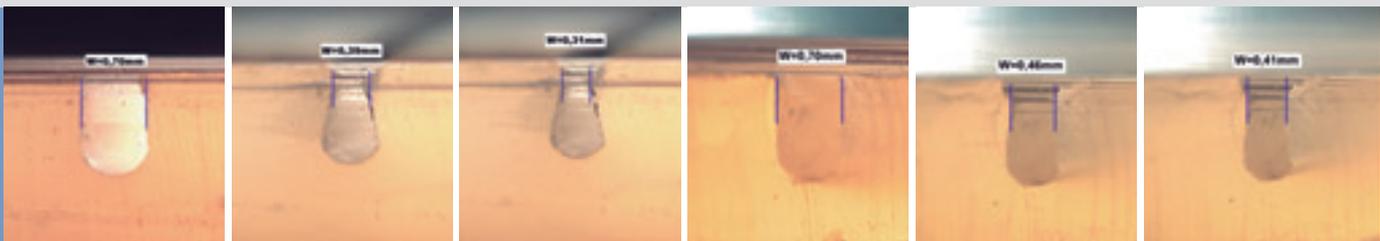
In comparison with press sleeves made of standard PUR, a distinct loss of dryness can be avoided.

It is of course a prerequisite here that the existing void volume in the nip exists even under load. On one hand the material used plays an essential role and on the other hand the selection of a groove geometry which, under load, prevents or at least significantly reduces a collapse of the groove. For this purpose, sleeve sam-

ples made of different materials were tested under well-defined conditions in the laboratory. Typical maximum pressures (6 MPa for woodfree grades and 8 MPa for groundwood grades and packaging papers) were simulated and the results compared by image-analysis methods. **Fig. 6** shows the resistance of QualiFlex QX, which leads to a 15 % higher open area and 25 % higher residual volume at a maximum pressure of 8 MPa as compared to standard PUR.

The result of these unique sleeve properties are improved CD moisture profiles and constantly high drynesses, which are reflected in higher production rates and lower energy consumption.

Therefore, the QualiFlex will continue to be the most reliable and economical product in the marketplace in the future.



Standard PUR P08M

1.0 mm deep
0 MPa linear load
storage capacity:
275 cm³/m²

6 MPa linear load
storage capacity:
184 cm³/m²

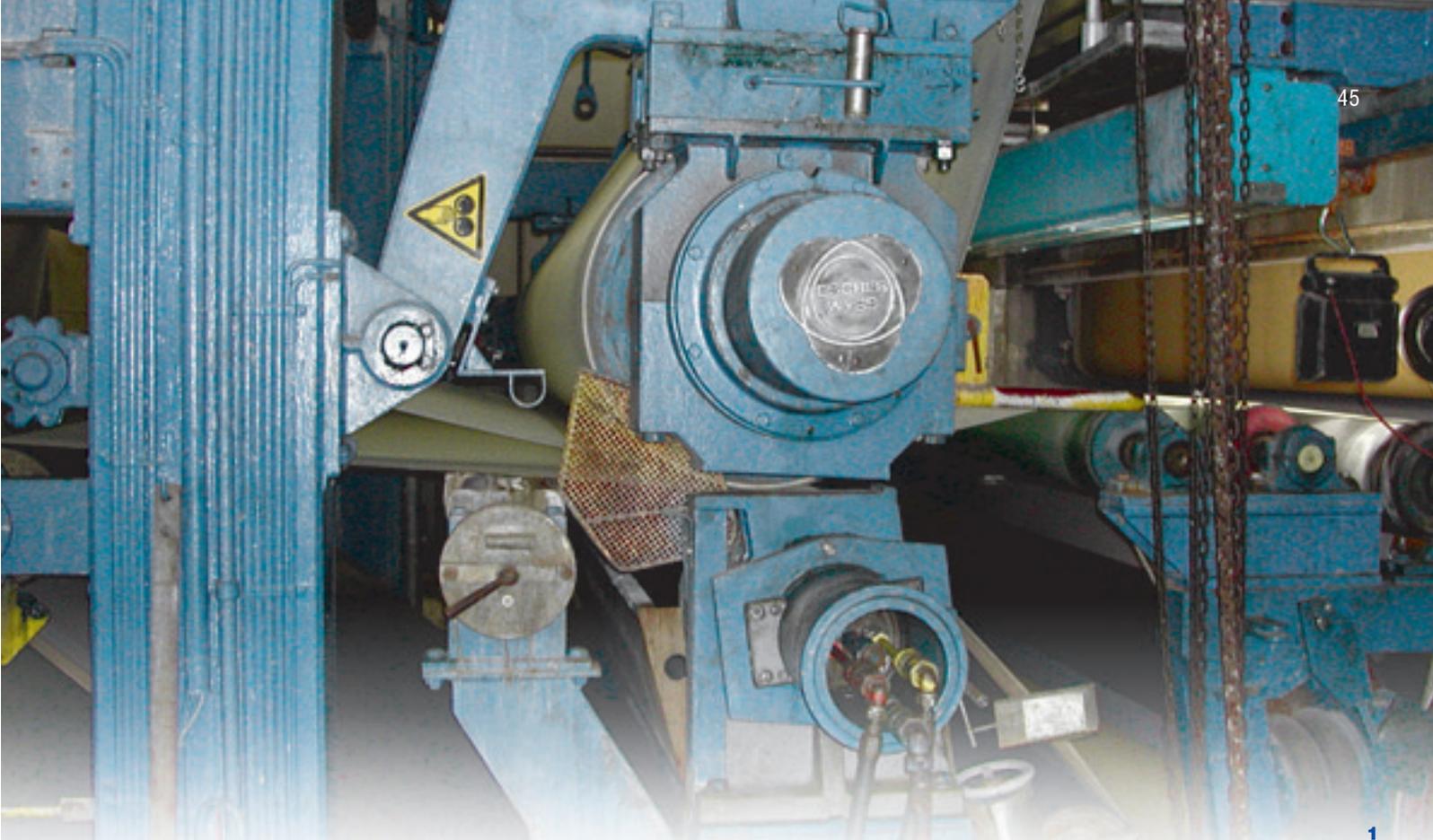
8 MPa linear load
storage capacity:
165 cm³/m²

QX P08M

1.0 mm deep
0 MPa linear load
storage capacity:
275 cm³/m²

6 MPa linear load
storage capacity:
210 cm³/m²

8 MPa linear load
storage capacity:
192 cm³/m²



Thirtieth anniversary of the Nipco system – Fitter than ever for the next thirty years



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The fascinating story of the Nipco roll started three decades ago – with 4.4 m working width, 250 m/min web speed and 120 N/mm line force – in the press section of a paper machine. That very first Nipco roll (Fig. 1) is still in service and doing its job just as well as ever. But its successors are clearly superior:

- Operating speeds are now eight times faster,
- Working widths have more than doubled, and
- Line force is five times higher – and in special cases even sixty times.

In view of this, there is only one thing to say: Nipco inventors have scored a great hit.

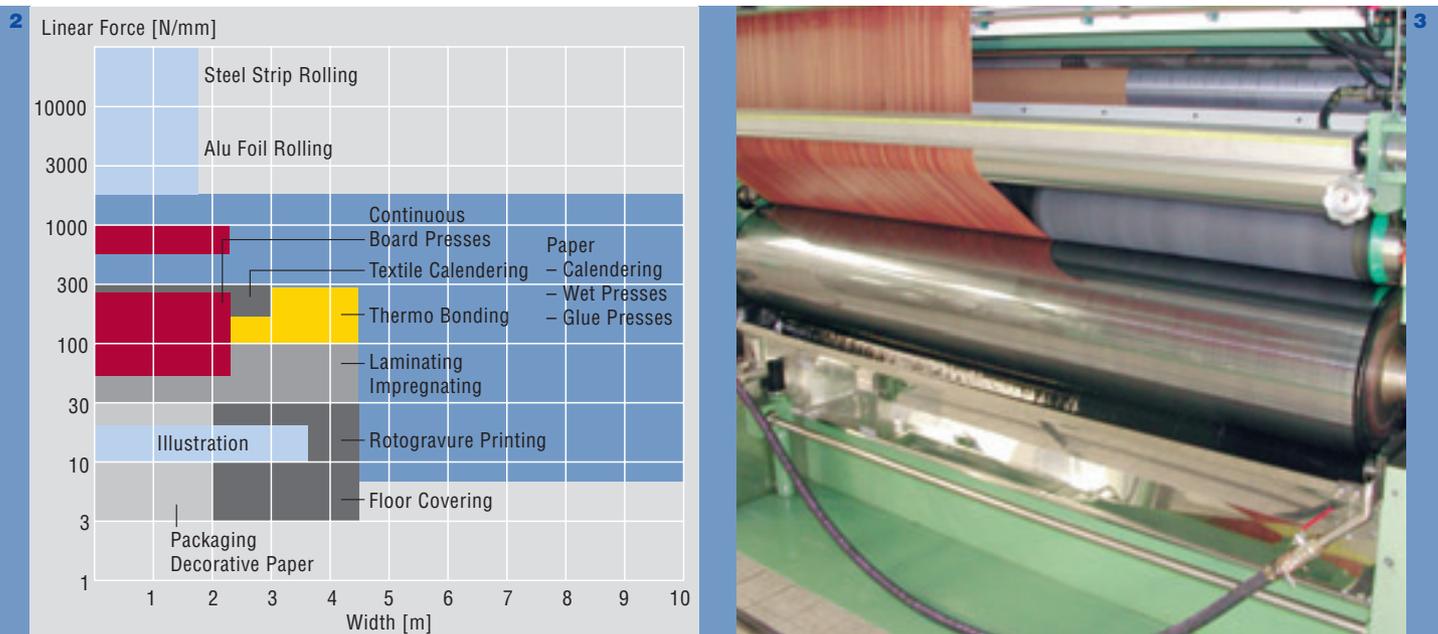
Rolls are of key importance in the paper industry. This particularly applies to the Nipco roll, which is rightly regarded as the heart of modern press technology, calenders and embossing systems.

Not so well known is the fact that Nipco rolls are also used in many other fields. The reader may be surprised that no fewer than 130 other applications apart from the paper industry have been found for the Nipco roll – ranging from chocolate refining to steel panel rolling for automobile bodywork. Out of these, ten applications have been implemented so far. Nipco rolls are used for example in the printing and textile industries, for fiber and chip board and nonwovens production (Fig. 2), and the experience gained in those applications has naturally helped toward the ongoing perfecting of this roll type.

Fig. 1: The first Nipco roll.

Fig. 2: Nipco roll application fields.

Fig. 3: NipcoPrint D96.



Returning to Nipco in the paper industry, it is notable that paper comes into contact with Nipco rolls several times both during production and during further processing. Here are two examples of this:

Decor papers

These papers not only pass between the Nipco rolls in the press section of the paper machine and in the Janus calender, but are also printed on a high-tech NipcoPrint D96 system (Fig. 3).

The **NipcoPrint D96** system is equipped with width adjustment, edge separation and a conductive polyurethane or rubber

position (which can also be asymmetrical), force is only applied directly to the web. And thanks to the gap immediately next to the web, there is no chance of ink reaching the highly flexible press roll sleeve. This interesting version of the Nipco roll has now been on the market for eight years.

Rotogravure printing papers

These papers place heavy demands on printability, and are, therefore, processed on a DuoCentri-NipcoFlex press with several Nipco rolls. The final finish is given with a Janus MK 2 calender incorporating a Nipco upper roll and a Nipcorect bottom roll with up to 60 zones. And to en-

sure really perfect printing results without any missing dots, a NipcoPrint G96 system with Electrostatic Assist (ESA) core-charging is used (Fig. 4).

The **NipcoPrint G96** has a flexible sleeve system to ensure that the paper is pressed uniformly over its entire width. The conductive sleeve surface is charged from within via the NipcoPrint press roll, which is electrically insulated from the rest of the machine. This enables perfect printing without missing dots at the very highest speeds and at all line forces. More than 600 NipcoPrint pressing rolls are in service worldwide over the last 25 years.

As mentioned above, the experience

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 Bolloré Group**

“The thickness profile results of the Monroll Nipcorect system on our 2-roll EcoSoft modular calender in PM 8 at Papeteries des Vosges are even better than we specified. Our cross-profile 2-sigma deviations are less than 0.50.”

Fig. 4: NipcoPrint G96.

Fig. 5: NipcoTex L.

Fig. 6: Monroll.

gained with Nipco technology in diverse application fields has steadily helped to improve papermaking applications as well. One of the best examples of this is the Monroll.

The Monroll

This latest Nipco roll developed for the paper industry derives some important features from the NipcoTex roll (Fig. 5), which has been used for several years in the textile industry for calendering fabric webs – not only the magazines we read have been in touch with Nipco rolls, but in many cases also the material our shirts are made of. This is best described as a kind of industrial ironing.

The **NipcoTex L** has a highly flexible roll sleeve which can simultaneously press against two counter-rolls arranged at 90°. It is likewise equipped with width

adjustment and edge separation, thus protecting the plastic sleeve from contact with the hot counter-roll outside the web width. Two processing steps at once, and fast web width changeover times, are extremely convincing arguments for the NipcoTex system. Together with the single nip version, more than 550 of these rolls are in service worldwide.

A particularly attractive feature of the NipcoTex roll is its plug-in bearing units. And precisely these have been adopted for the Monroll concept – although that required a lot of detailed adjustments. The result is an innovative Nipco roll with compact modular design, whose narrow support elements are so close together that the extremely sensitive cross-profile control required in the paper industry is easily attained. Depending on technological requirements, the Monroll either has a hardened steel sleeve (for hard-nip applications), a non-hardened steel sleeve with

plastic cover or a plastic sleeve for soft-nip applications (Fig. 6). The thickness cross-profiles attainable with this combination have exceeded all expectations.

Summary

The Nipco concept has made its mark worldwide in various industries. For many years Voith Paper has systematically exploited the synergies between these different application fields, thus providing the market with powerful, dependable systems perfectly tailored to specific needs. The Nipcorect roll with its high-precision line force application sets benchmarks for calendering smoothness, gloss and cross-profile control. The widest soft or hard calenders and Janus calenders have used this technology for years.

Nipco – fit for the next thirty years.





The new winder mathematics – one is more than two.

Why Pitten and Ruzomberok require only one winder for each paper machine

The VariFlex two-drum winders recently put into operation by Voith Paper at the Pitten/Austria mill of Hamburger AG and at the Ruzomberok/Slovakia mill of Neusiedler SCP AG have aroused the attention of experts in the paper industry. Quite rightly! One single winder is sufficient in both cases to cope with the entire production of each preceding paper machine – and, as is well known, in the past two winders each would have been required.



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This “miracle of productivity” has three main reasons:

- First, the high operating speed of the new machine
- Second, its steep acceleration ramps
- Third, the drastic reduction in roll changing times.

Following is a more detailed description of the measures taken to achieve this “leap forward” with success.

Before going into details, an overview of the two winders shall be given:

Pitten

The VariFlex M installed there belongs to PM 4, on which liner, testliner and paper-board with basis weights between 100 and 250 g/m² are produced. The winder

Fig. 1: VariFlex M Pitten PM 4.

Fig. 2: VariFlex L Ruzomberok PM 18.

Fig. 3: Scheme VariFlex L Ruzomberok PM 18.

2



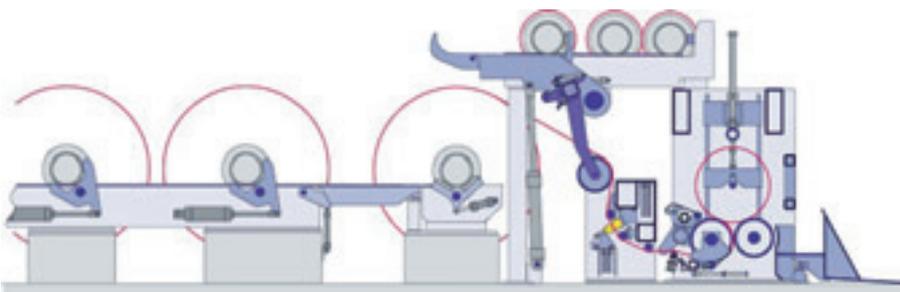
has a trim width of 5,100 mm and can be operated at a max. speed of 2,700 m/min. The capacity is 1,050 t/day (Fig. 1).

Ruzomberok

The VariFlex L that went into operation at Ruzomberok has a trim width of 6,500 mm. Its maximum operating speed is 2,500 m/min. With a capacity of

895 t/day, it processes the entire production of PM 18, on which copy paper with a basis weight of 77 to 83 g/m² is produced (Fig. 2). In contrast to the Pitten winder, which has “only” a standard unwind, the VariFlex at Ruzomberok is equipped with a storage for parent rolls and reel spools as well as a Flying Splice unit (40 m/min) (Fig. 3).

3



The “secret” of the high productivity

The three factors which together explain the recent success have already been named. They shall now be treated more thoroughly in consecutive order:

Increasing the operating speed

Up to now the operating speeds have generally been between 2,200 and 2,300 m/min. For the two winders in question a higher operating speed was considered from the very beginning. Previously, however, the idea was to determine exactly at what maximum speed the winders could be operated reliably under all circumstances. For this purpose, Voith performed extensive trial runs. Their results showed: 2,500 m/min are “feasible” as peak value for the operating speed.

The results achieved in Pitten and Ruzomberok – perfectly wound finished rolls with an excellent winding structure! – prove that Voith has approached the limits of the feasible with the increase in the operating speed without, however, exceeding them. If one considers that, for example, copy paper like that produced in Ruzomberok is a not uncritical grade due to its naturally high coefficient of friction – papers with a high coefficient of friction tend, as is well known, to cause vibrations during winding – it is found that it worked out on a completely different line.



Walter Gems
Manager
Control
Systems &
Project
Manager
Rebuild PM 4
Pitten

“We are very satisfied with the new VariFlex. Thanks to its high degree of automation – the short roll changing times are unique! – the winder follows the paper machine at all times without effort and safely. With the VariFlex, Voith has ‘done a fantastic job’ and deserves every compliment for this unique, productive machine. The entire handling of the project was exemplary.”

Steeper acceleration ramps

In the past, acceleration ramps of 20 to max. 30 m/min/sec were common. The corresponding values in Pitten and Ruzomberok – they are around 40 m/min/sec! – have played their part in increasing the productivity of both machines.

Drastic reduction in roll changing times

On envisaging the processes that take place during winding, it becomes evident that the mentioned higher operating speeds and the steeper ramp curves alone would not have been sufficient to trim the winders lastingly to the desired capacity of 1,050 t/day (Pitten) and 895 t/day (Ruzomberok). A drastic reduction in the roll changing times was additionally required here. And it was accomplished: during the insertion of new cores, the severing of the old webs and the laying of the new web beginnings on

Fig. 4: Core handling.



the empty cores in fully automatic mode cost 50 to 60 sec – a “manual” roll change took even up to 2 min – Voith reached stopwatch times of 30 sec (Pitten) and 20 sec (Ruzomberok) with the new VariFlex. As the solution found for Pitten deviates somewhat from the one implemented in Ruzomberok, both variants shall be presented separately here below:

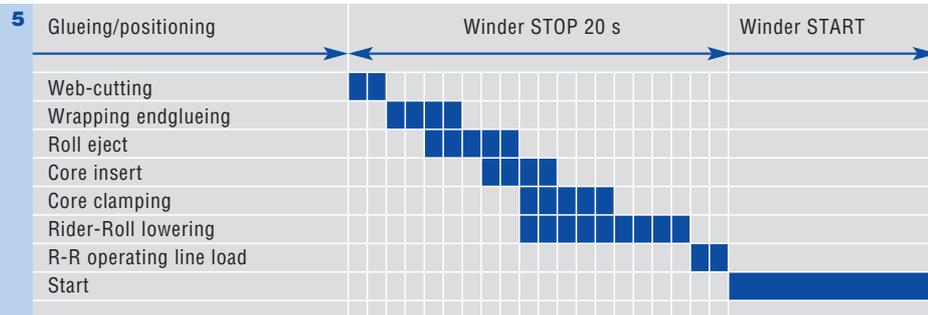
Pitten

In Pitten, paperboard with a basis weight of up to 250 g/m² is produced. At such basis weights the process in which the traces of glue are applied for initial and final gluing exclusively onto the paper web – more precisely the single webs – is no longer sufficient. For the initial gluing the empty cores must rather be glued. This is done outside of the machine. The glued cores are subsequently taken up by core tongs and during roll ejection brought into a position above the winding bed. To ensure good initial winding of the new set, the trace of glue must of course be exactly aligned to the new partial web

beginnings. By consequence, the cores must not be allowed to “tumble” simply into the winding bed by opening the tongs. Therefore, the tongs are provided with a telescopic vacuum strip, which pneumatically runs to the still clamped cores and holds them firmly by vacuum. After the tongs have opened, the strip lowers the set of cores hanging on it gently and accurately into the roll bed (Fig. 4).

The above-described core insertion is, of course, only a small part of the complete roll changing process which furthermore includes stopping of the almost finished rolls, severing the webs, ejecting the roll set etc. All these single actions add up to a considerable length, provided that each subsequent step is only completed if the previous one has been fully terminated (step chain control). Through the use of modern path detection and proportional technology for all changing functions involved, Voith has now, however, implemented a maximum number of movement overlaps and thus drastically reduced the changing time (Fig. 5). Only this guaran-

Fig. 5: Roll changing process with overlapping movements.



teed that the VariFlex can in fact reliably follow the PM.

Incidentally, a different glue is used in Pitten for the gluing of the beginning than that used for the gluing of the end. This again has to do with the sometimes very heavy grades that are wound here. These heavy grades tend not to want to wind themselves around the core at the start of winding. They literally “resist” doing so. This resistance can only be broken by using a glue with a greater adhesion. Things look different with the gluing of the end: the radius of the finished rolls is so large that the resetting forces of the web can now no longer play any decisive role. As a consequence, a glue can be used here that has less adhesion than the adhesion of the glue for gluing the beginning. An important criterion for the end glue is, however, its short hardening time: If the glue between the outer layers of the finished rolls did not “set” in good time, safe transport of the rolls in the mill would not be ensured. Clamp forklifts might “lose” such rolls during transport.

This must be avoided under all circumstances. This is the reason for using different types of glue for each.

Ruzomberok

In Ruzomberok, automatic changing is easier than in Pitten. Because the basis weights are between 77 and 83 g/m², the complex procedure of specific insertion of the cores and the separate gluing of the beginning described above becomes superfluous. This also explains the difference in the stopwatch times: Ruzomberok (20 sec) and Pitten (30 sec).

It must not remain unmentioned that parent roll handling in Ruzomberok (Fig. 3) also produces a large gain in time and capacity. The changing time savings achieved by the flying splice alone are enormous. In addition, the preparation of the following parent rolls for the splice or the introduction of the web can take place in the parent roll storage in parallel with production. This storage rack itself is a convenient roll buffer for the PM and makes complex roll handling with a crane superfluous.

Robert A. Dokter
Manager of Competence Center Engineering & Safety and Project Manager IMPULS PM 18, Ruzomberok



“We are enjoying an excellent relationship besides a harmonic and good cooperation with Voith Paper on a long time base. As a matter of fact, we are ‘together’ in business relation since almost one century when first orders from Ruzomberok mill to J.M. Voith were placed. Besides the technological advantages, this was also a main reason why we selected Voith Paper to rebuild our PM 18 and to deliver the new VariFlex for the upgraded line.

In retrospect, I can say that our decision was right. All the goals under quality and schedule terms were met. Our new high speed winder with its various novel technical features made a perfect initial start-up, reached its top operation speed in shortest time and is now in continuous operation since October 2003. In one word: It is a most convincing illustration of ‘engineered reliability’!

Let me add that the cooperation between all persons involved was excellent. This helped both sides remarkably in achieving the targets.

Neusiedler SCP would like to take this opportunity to express their heartfelt thanks to Voith Paper’s personnel taking part in the IMPULS PM 18 project.”



Indonesia's Service Center reaches the extremes of South East Asia

For the readers of our twogether Magazine, it may seem quite recently that we proudly announced the inauguration of another Service Center, this time in Indonesia. More precisely it was in our twelfth edition. However, since April 2001, this now mature Service Center has accumulated innumerable accomplishments not only from a technical viewpoint, but also with regards to market strategy. Voith Paper Service Indonesia today encompasses a pool of customers stretching from New Zealand to India; from Australia to the Philippines.

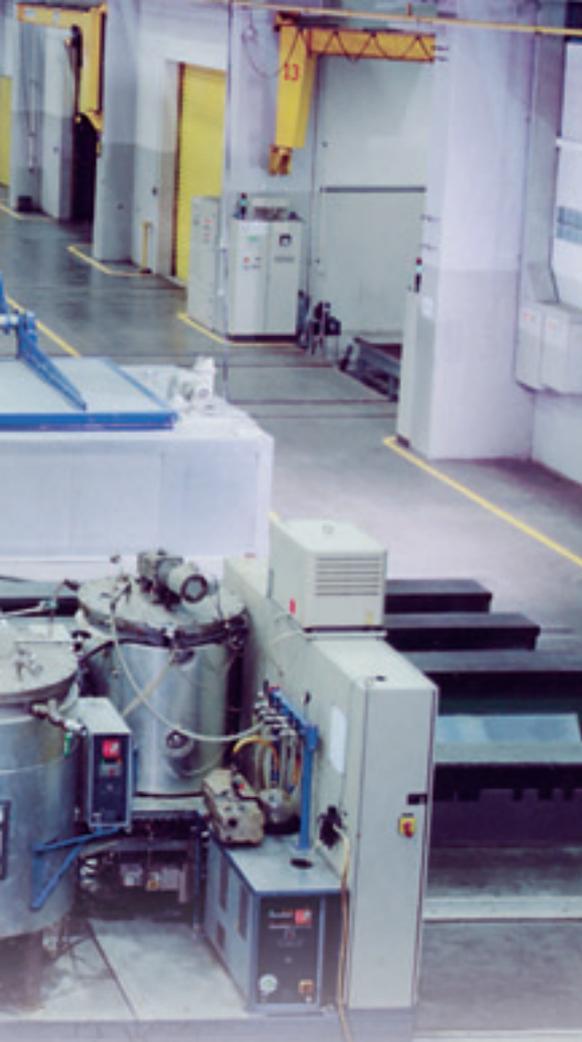


Sergio Fukamati

Service
sergio.fukamati@voith.com

Ideally located in Jakarta's industrial hub 70 km from Indonesia's main port, the Karawang Service Center has the ability to service any OEM roll from the pulp and paper-making industry. This world-class facility of almost 7,000 square meters equipped with the latest technology is a

reflection of Voith Paper's commitment to providing advanced roll cover technology and mechanical services expertise to the Indonesian and South East Asia Pulp and Paper Industry. It epitomizes Voith's continued support and commitment to our regional customers.



Figs. 1 and 2: Karawang Service Center.

Rolls previously sent to Europe or the US for specialized covering and servicing, a process that took several months due to the long distances and bureaucracy, are now flowing to the Karawang Service Center. The mills in the region are benefiting from the same level of service, quality and expertise locally, saving both time and money.

“Being present in the region, building relationships and reacting quickly to our customers’ needs has allowed Voith to become an important partner in satisfying their roll maintenance and cover needs.”

In addition to the Indonesian mills, we have expanded our market to the entire South East Asia region, country-by-country, customer-by-customer. First we had to convince customers in other countries that the Karawang Service Center was able to meet their expectations. Several

customers were invited to visit the facility to form their own opinion of Voith’s capabilities and expertise. This effort has proven to show the customers that the Karawang Service Center is a competent partner for their roll needs. Customers that have visited the Karawang workshop, and subsequently sent their rolls to us, are our best references.

Among them are important paper manufacturers from **Australia, New Zealand, Bangladesh, Thailand, Malaysia, the Philippines, Taiwan and South Korea**. Many of the largest and most critical rolls in those countries are now running with rubber and polyurethane covers produced in Karawang.

More recently, **India** joined the list with a successful undertaking in late December. After an unexpected failure of their Suction Press Roll cover, the management of **Tamil Nadu Newsprint and Papers**

Limited was searching to find a reliable and fast alternative to send their suction roll shell for recovering. The service center in Indonesia offered a proposal with a very ambitious delivery schedule. Despite the bureaucratic customs procedures in both countries, the turn-around time was a record as the suction shell recovered with Polyurethane – Aqualis – (1,300 mm OD x 7,250 mm L) did not stay in Indonesia for more than 4 weeks, in spite of the year-end holidays.

Similar stories involving customers from other Asian countries have helped to forge our reputation as the preferred Roll Service Center in South East Asia. Voith Paper’s facility in Karawang continues to prove that in an industry where time is money, proximity is the best service. Combined with Voith Paper’s global expertise, Karawang is capable of providing a complete range of services to its customers.

T. V. V. Satyanarayana

Tamil Nadu Newsprint
and Papers Limited

“When the rubber covering of our PM 2 suction press roll failed, we were looking for fastest way of getting it recovered with Polyurethane instead of rubber. On the recommendation of Mr. Panigrahi of Voith, India, Voith Paper Service, Karawang works was contacted for this work.

Voith Paper Service, Karawang carried out the polyurethane covering in a very tight time schedule to meet our pressing requirement. We are fully satisfied with the time schedule and quality of the services, which prompted TNPL to choose them for recovering the spare shell as well.”

Impressions of Indonesia:

Fig. 3: A fishing platform off the coast of East Java.

Fig. 4: Preparing rice field for planting, Bali.

Fig. 5: Young rice in fields, East Java.

Fig. 6: Upper levels, Borobodur temple, Central Java.

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The workshop at a glance

The scope of capabilities provided at Karawang include suction roll rebuilds, variable crown roll rebuilds, spreader roll overhaul, dynamic hydraulic roll testing, thermal arc-spray repairs, dynamic balancing, roll cover drilling and shell honing, and journal replacement along with other regular mechanical services.

Combining rolls manufactured in several plants from the Voith Paper group, with a whole range of covers produced in Karawang, the Service Center is capable of providing all kinds of replacement rolls. There is also a dedicated team to handle “stock preparation”-rotor and vacuum pump refurbishment.

The Karawang Service Center is the only service center of its kind in Indonesia, offering service with a wide range of re-

quirements. Crane system capacity, modern CNC turning and grinding equipment, multi-spindle drilling machines and dynamic balancing units allow the handling of all roll types, up to 13 meters long, 2,000 mm in diameter and weighing up to 80 tons.

The Karawang Service Center provides **Voith Paper’s roll cover technology both in rubber and polyurethane**. The most advanced cover systems in both categories are manufactured in the facility and have excellent performance in the paper and pulp industry. Supported by an intensive research and development program, polyurethane and rubber covers continue to have outstanding performance in the positions to which they are applied. All covers processed in the Karawang facility are tested thoroughly prior to shipping to ensure that manufacturing specifications are achieved and



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quality standards are met. The cover and service technology at the Karawang Service Center has been transferred from Voith's R&D centers in Europe and North America.

Field service is also provided and coordinated outside of the center. Mechanical repair and diagnostic service such as vibration measurements, headbox repairs, dryer section repairs, machine alignment, roll changing assistance, mobile roll grinding and on-site thermal spraying of cylinders are but a few of the many offerings.

The continuous sharing of shop and process 'best practices' ensures that the same level of service, quality and expertise is provided to our customers all over the world; **'global resources supplied on a local basis'**.

Mervyn Sayers

ABB Kinleith Maintenance Manager PM 6



Simon Clark

CHH Kinleith Business Unit Manager



"Kinleith is Carter Holt Harvey's largest mill, located in the central North Island of New Zealand and producing 250,000 t bleached and unbleached softwood kraft pulp and 320,000 t of a wide range of linerboards used in packaging.

In the highly competitive market conditions in which Kinleith operates it has been necessary to constantly review our operations to ensure that they deliver value to our customers and our shareholders. Some of these changes have far-reaching effects in the way the New Zealand's facility operates.

A major modernisation in 1998/99 and a restructuring of mill operations in 2003, including a maintenance partnership with international company, ABB Ltd, are examples of the changes required to meet these challenges.

The company is committed to total quality in all aspects of its business – from the uniformity of wood fiber to the

final delivery of finished products into customers' warehouses when the customer requires it. Rolls and roll covers performance directly affects the quality of our finished products. They are an integral part of the process and it is important that there are facilities close by that can meet the maintenance and recovering needs of the mill.

The Voith roll maintenance plant in Jakarta has been meeting most of Kinleith's needs since it opened in 2001, and is proving cost efficient and reliable with good quality control of the complex covers required by the Kinleith mill.

It has the added advantage of being closer than traditional roll covering facilities and as any maintenance or production manager knows, the shorter time that you have your spare roll away for repair or recovering, the less stress you put your plant and yourself under. The Jakarta plant has reduced typical turnaround times by 6 of 7 weeks whilst providing quality products."

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Cesar Schneider

*Service South America
cesar.schneider@voith.com*

Opening roll covering factory São Paulo, Brazil

On September 20th, 2003 Voith Paper Service São Paulo opened a new factory for roll covering. As the South American market offers significant opportunities, Voith Paper decided to invest 10 million US\$ in its Brazilian plant to strengthen its position in South America.



Fig. 1: Service Center São Paulo, Brazil.



Fig. 2: Quality control lab.

Fig. 3: Autoclaves.

Fig. 4: Rubber cover manufacturing.

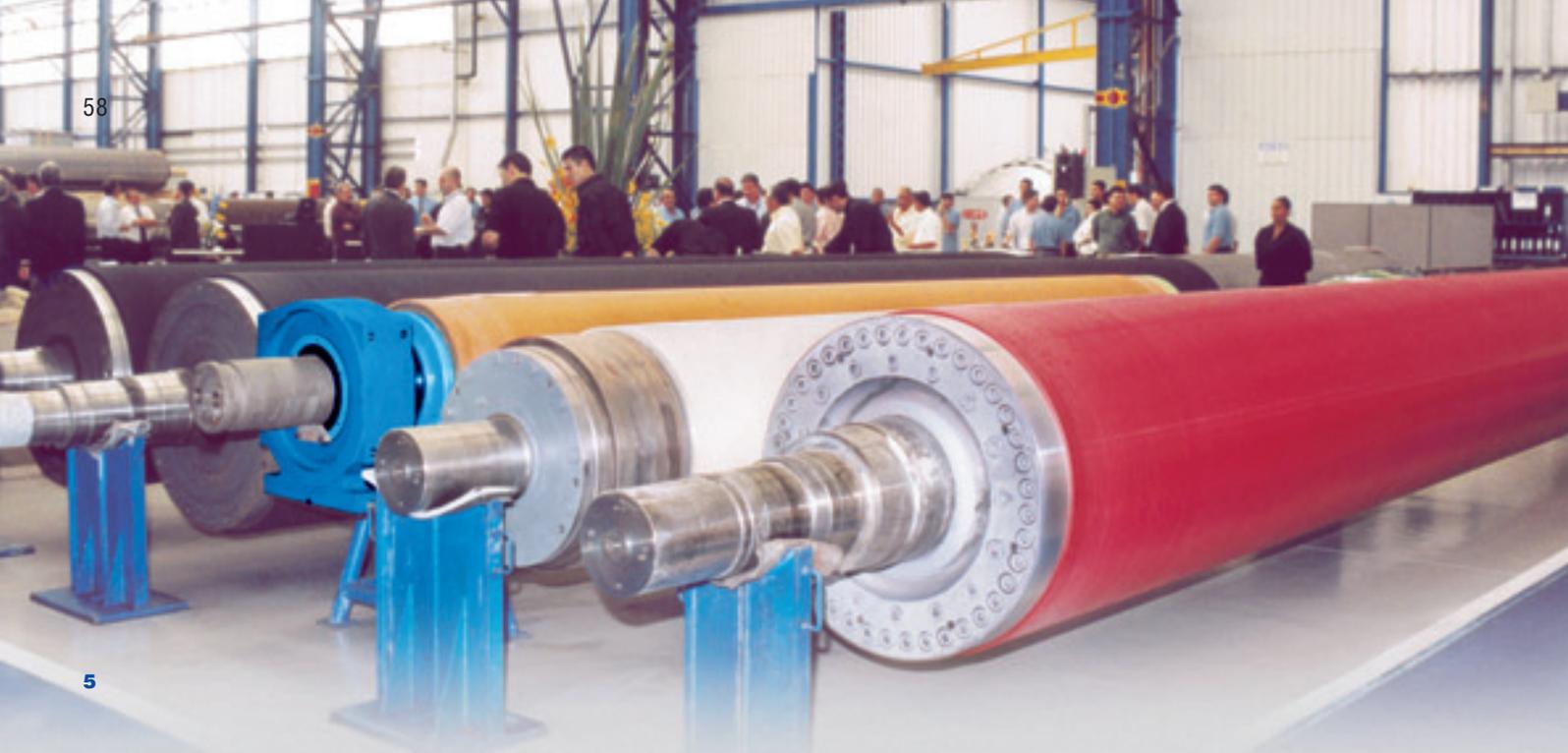
In its 40th year in Brazil, Voith Paper Service is now able to supply to our Latin American customers the highest international standard of roll cover technology for virtually any roll used in the industry. The process of roll covering was acquired from the Scapa Group, that was taken over by Voith Paper in 1999.

polyurethane and composite in addition to the already existing technique of roll covering with rubber. This is a huge improvement for the customers as the rolls previously had to be shipped to Europe or North America causing extra costs and delays. Due to the new factory, it is now possible to shorten delivery cycles dramatically.

By transferring this technique from Europe and USA to Brazil, Voith Paper Brazil has become the only company in South America that is capable of performing the previously unavailable roll covering with

The importance of this step taken by Voith Paper can be easily explained by taking a look at the current market situation and its forecast. Today, about 10%





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of the total turnover made in Brazil is made by Voith Paper Services. Cesar Schneider, Vice President of Voith Paper Service Division in South America, is expecting a growth in sales of 25% in 2005. The South American market for roll covering has an average volume of 30 million US\$.

The demand for advanced roll covers in the South American market continues to show a strong increase. South American paper producers are driven by higher paper quality requirements and the need to enhance paper machine operating efficiencies. This expansion gives our customers greater access to Voith's most advanced roll cover designs, supporting the competitiveness on the international market.

The unit in São Paulo offers rebuilds, maintenance and repair for all pulp and

paper equipment on a larger scale than ever before. It is fully equipped with crane systems, lathes, grinders and all the necessary technology for roll covering. About 20 employees are working in the cover plant and 10 more are expected to start working during 2004.

The opening took place on September 20th, 2003 in the Voith facilities in São Paulo. Among the visitors were directors and managers of important South American paper companies and Mr. Ray Hall, former Executive Vice-President of Voith Paper Service. He opened the event with a speech about the roll covering market and its future development. Following Mr. Hall's speech, Mr. Cesar Schneider, VP of Voith Paper Service Division in South America, talked about the local roll covering market and the opportunities for Voith Paper Service. After visiting the new factory, cocktails were served

to celebrate the opening of the new factory.

Another festive event was the production of the 10,000th roll in Brazil. Starting in the 90's, Voith Paper Brazil has become the biggest supplier of Voith rolls, for the entire world market.

Voith Brazil is celebrating its 40th anniversary in Brazil this year. The São Paulo plant is the competence center for tissue paper machines and specialist for the production of drying cylinders and rolls. Today, Voith Paper Brazil exports its machines to over 50 countries worldwide.

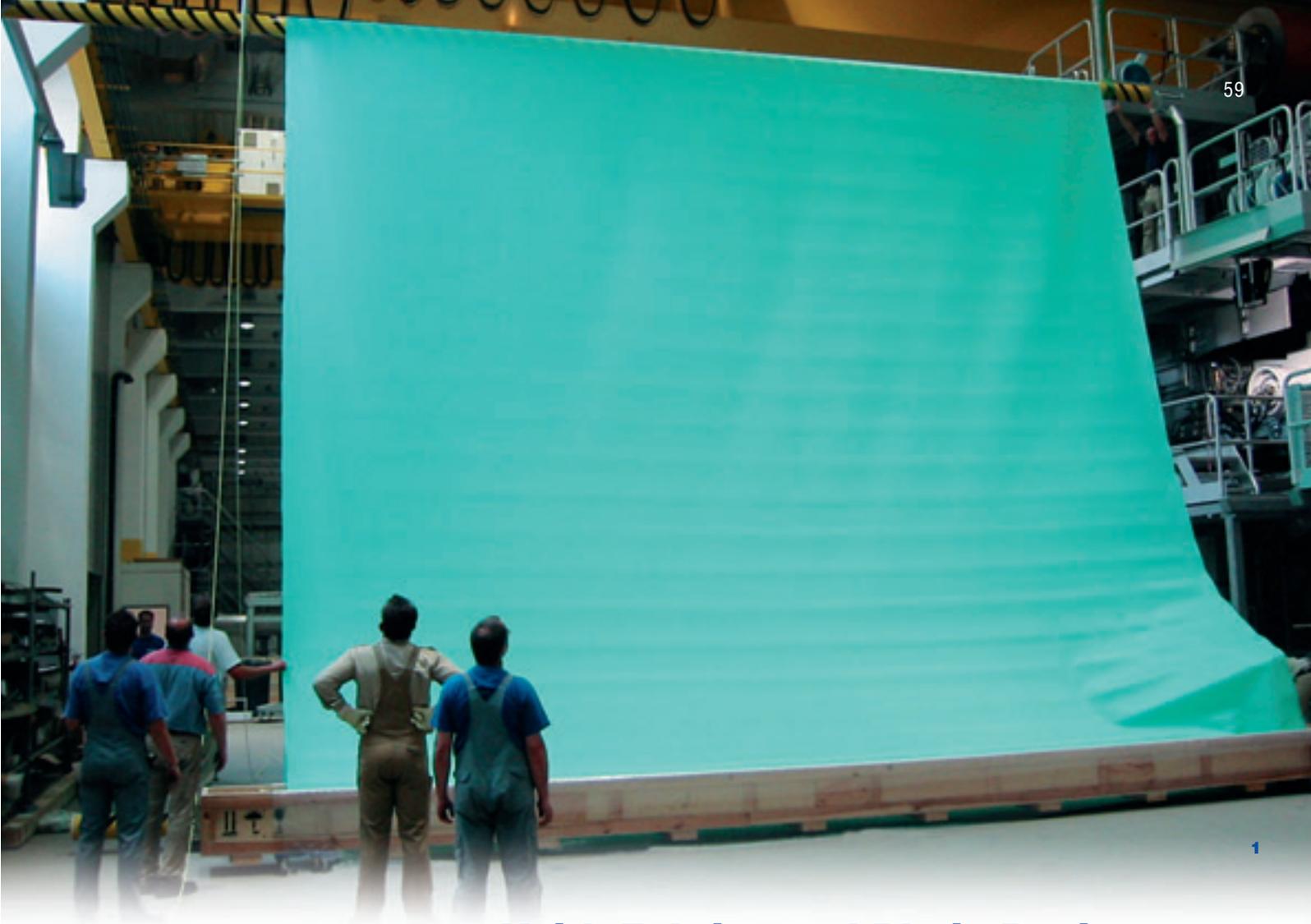
By opening the new roll covering factory, Voith Paper Brazil is now offering even more technology of the highest international standard and first class service to our customers.

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Fig. 5: Service Center of São Paulo.

Fig. 6: Cesar Schneider at opening ceremony.



Voith Fabrics and Rhein Papier – Synergy is winning in Hürth

How teamwork is helping break new records



Martin Serr

Voith Fabrics
martin.serr@voith.com

What motivates people at Rhein Papier Hürth? First, it's the desire to be the fastest in the world. Next, it's the goal of being the efficiency winner. And most of all, it's the drive to achieve superior quality.

In the business of high-speed newsprint, the Rhein Papier team must consistently perform at a higher level with little margin for error. They must also develop special relationships with suppliers and push to achieve higher quality while finding greater efficiencies through synergy between clothing and machinery.

As Rhein Papier Hürth operations manager Dirk Schwarze puts it, "Just like in

Formula One racing, you start with a superior car. Then there are the tires. If the driver is to reach peak performance, it's the tires that will deliver that incremental winning edge. It's the same with the paper machine and machine clothing. And we are trying, with the help of our suppliers, to reach a new level on a machine that already holds the world record for newsprint speed."

Fig. 1: Fabrics changing.

The fundamental goal for the Rhein Papier Hürth team is a balance between high production efficiency and achieving key properties sought by the company's printer customers. Schwarze sees quality and efficiency as going hand-in-hand and relating closely to machine clothing, chemicals and other factors that effect machine performance.

"Our Balance Program is an intensive effort designed to slightly modify clothing and machine parameters with the goal of producing fewer breaks on printing presses and improved print quality," said Schwarze. *"We've asked suppliers like Voith Fabrics to be part of our team to reach a maximum quality level."*

How much difference can clothing make?

Says Thilo Schuler, Paper Machine Process Engineer at Rhein Papier Hürth, *"With our goals for lightning speed and efficiency, slight changes and improvements are a must for us. Voith Fabrics has developed good fabrics. But, we are seeking peak performance, which can only come through incremental customizing."*

To this end, Voith Fabrics is working with Rhein Papier Hürth toward a higher level of optimization through the Balance Program. This entails on-going monitoring

and collecting data as well as making small adjustments to achieve peak machine efficiency.

According to Fernando Blanquez of Voith Fabrics' technical service group in Germany, the scope of their work includes dewatering, vacuums, chemical aids, mechanical setup of the machine, fabric data, design, weft and yarns. *"In addition, we look at technical data from the lab to analyze density, thickness, smoothness and virtually all important paper properties,"* he said.

Thilo Schuler comes to the essential point, *"If you change a retention aid in a small way, the program shows you what's important about the change, or that a particular change mattered little. We all know that the goal is to continually nudge performance to a higher level and modify it to meet quality targets. Getting costs down for Rhein Papier is good, but not at the expense of performance on the printing presses."*

Martin Serr, Voith Fabrics' head of sales for Germany and Switzerland, sums it up this way, *"The better we can define the existing situation, the more we improve the possibilities of influencing the quality of the paper. When we understand in depth how their machine reacts with various adjustments, including the influence of clothing, we will help Rhein Papier Hürth and pioneer the next generation of clothing."*

Schwarze emphasizes the importance of key suppliers like Voith Fabrics on the Rhein Papier team.

As he puts it, *"We depend on our suppliers to be part of our Balance Program. I see no distinction between Voith's fabrics and Hürth people. Much like in Formula One racing, we're all in the pit together and all contributing to winning the race on a repeat basis."*

Secrets at risk? Rhein Papier Hürth thinks not

Schwarze suggests that Rhein Papier Hürth is allowing a great deal of data to be gathered by Voith, which includes part of Rhein Papier's know-how. He said the company understands and accepts the risks of bringing a supplier so closely into the papermaking process. *"If we are going for the best, a real, trust-based partnership is a necessity,"* he said.

"You gain a lot when you don't have to have eyes on so many things," Schwarze continued. *"For our customers to gain we must continuously improve our product quality. That means learning something about the clear links between the properties of the sheet and machine parameters. We want more ways to zoom in on quality enhancement. We want our products and papermaking to be more stable. Then we can really advance."*

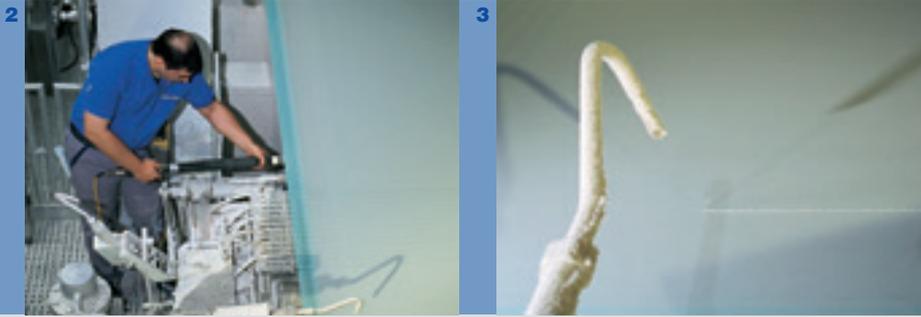


Fig. 2: A waterflow test of the forming fabric.

Fig. 3: The waterjet trimming the width of the paper.

Fig. 4: Hürth PM 1 and Voith Fabrics team members.

Advances since startup

Rhein Papier started up PM 1 on July 4, 2002 and maintained very high speeds over the initial six weeks – about 1,560 m/min. Then came the time to work out some machine programming bugs, including the reality of some unplanned shutdowns. From September on the primary focus continued to be on increasing speed, followed by efficiency.

From September through November 2002, speed was increased each month by 50 meters. By the end of 2003, Rhein Papier Hürth had reached 1,810 m/min at 82% efficiency, and 85% efficiency at slightly lower speeds. On March 21, 2003, PM 1 reached the world record speed of 1,912 m/min. As of February and March 2004, the machine was running at 87.3% efficiency with an average speed of 1,800 m/min.

Schwarze acknowledges that over the last 18 months, the machine has experienced

some down moments. But he sees them as a thing of the past. October through April 2004 proved to be long periods of excellent production. He sees 2004-05 as the year of efficiency, aiming in the area of 90%.

Success

According to Schwarze, at the time of startup in 2002, the company had customers with different needs. *“While all customers made newsprint, they printed in different ways, and that means different properties in the sheet,”* he said.

From a customer viewpoint, “paper quality” is currently the center of Balance Program. Rhein Papier believes its 100% DIP sheet already meets most customers needs without filler or the addition of virgin fiber.

To help further improvements in sheet quality, Rhein Papier Hürth has expanded its team beyond machinery and clothing to include a chemical supplier to add insights into the process. The chemical supplier now takes part in papermaking at Hürth, as well as trials on a Voith Paper trial machine. Based on observations made on the trials, Hürth is better able to determine how particular chemicals, application points and dosages influence the sheet, as well as clothing and adjustments of the dewatering elements in the machine themselves.

Stiffness and high specific volume are important properties on the quality side. Runnability and efficiency are demands on the commercial side. *“If you look at the sheet, one of the important properties is stiffness for the large format newspapers,”* said Schuler. *“If you loose stiffness the newspapers flops over. Also in the converting plant, the grabbers that transport the inserts can work poorly with a low stiffness paper.”*

This quality focus by the different team members – Rhein Papier, Voith Paper, Voith Fabrics and other suppliers – leads to success on the quality side, as well as reaching the commercial goals.

Spirit of teamwork

Schwarze is an advocate of real teamwork, not just the talk of teamwork. In his words, *“The spirit here is to speak in an open way, so that understanding allows us to solve problems. All of our efforts need to give the operator the feeling that we’re all working in the spirit of the customer. Motivation makes the best paper. Teamwork includes solid support from our suppliers.”*

Says Voith Fabrics’ Serr, *“At end of the day, the performance of the product running on printing presses is paramount to all of us. Our customer’s customer is really our customer, too. If they are happy, we all have a reason to celebrate.”*





The Ultimate Synergy – Voith Fabrics, Voith Paper and the Customer

Extreme conditions demand extreme fabrics was the theme for Voith Fabrics' first-ever International Customer Seminar, held March 10-12th in Cologne, Germany. The event showcased the ultimate synergy – Voith Fabrics, Voith Paper and the global paper-maker – and brought together over 70 Graphics customers from 15 countries to discuss the latest Voith Fabrics innovations in paper machine clothing technology.



Jade Finley

*Voith Fabrics
jade.finley@voith.com*

The event began on the evening of Wednesday, March 10th, when Dr. Peter Huber, SVP Europe/Asia, warmly welcomed over 100 guests to the Voith Fabrics Graphic Papers International Customer Seminar. After Dr. Huber's welcome, the guests moved upstairs to the top floor of the Dorint Kongress Hotel to

enjoy a lovely dinner and a spectacular view of the Kölner Dom.

Thursday morning began with Voith Paper Technology CEO and Member of the Voith Corporate Board of Management, Hans Müller, providing the welcome and setting the tone for the entire day of presen-





tations. An impressive series of technical papers and reports followed.

The first section of presentations, the forming section, was led by Jorma Järvinen, Application Leader/Forming for Voith Fabrics. Järvinen introduced the latest breakthroughs in forming fabric technology, the PrintForm H Series fabrics. The PrintForm H Series have been designed to provide papermakers with better printability, improved sheet quality, excellent runnability and reduced sheet two-sidedness. The PrintForm H Series includes: PrintForm HA, PrintForm HC and PrintForm HT.

Papermakers were then given a presentation on the VP Duo Gap Former from Cordula Mraz, Technology Engineer/Forming for Voith Paper. The presentation highlighted the Voith Paper former family (including the DuoFormer TQ, TQv and TQm) as well as recent rebuilds and experiences.

Part 2 of the day's presentations was led by Hans Ragvald, Voith Fabrics' Application Engineer/Press. Ragvald reviewed the benefits of Voith Fabrics' Four-Stage Platform for pressing, which provides solutions with stage one Vector® tri-axial designs and stage two PrintFlex P. PrintFlex P is Voith Fabrics' latest press innovation to hit the market. It offers improved press dewatering, increased sheet smoothness, greater wear resistance and

has proven to provide better print quality and a reduced level of missing dots.

Thomas Augscheller, Product Manager/Press for Voith Paper, and Dr. Jens Müller, Head of Center of Competence NipcoFlex and QualiFlex, followed with presentations covering economical paper production with modern press concepts and innovations in press sleeve technology for shoe presses.

Following lunch was the third and final section of presentations, the dryer section. Rolf Sieger, Voith Fabrics' Sales and Product Manager/Dryers, reviewed the PrintTech family of dryer products – PrintTech QS, PrintTech QC and PrintTech M. These new generation dryer fabrics are proving to show superior web control, high drying capacity, easy installation, high seam strength and increased abrasion resistance for improved fabric life.

Dominik Mai, Technology Engineer/Drying for Voith Paper, followed up the dryer fabrics presentation by reviewing the latest in TopDuoRun concepts – developments in the single-tier dryer section that can change the appearance and performance of future paper machines.

Each segment of presentations was accompanied by a customer case study – showcasing the value-added solutions achieved by teaming Voith Paper, as well

as other machines including Metso, with Voith Fabrics. Dr. Josef Hafellner, SCA Laakirchen; Mr. David Procter, Stora Enso Port Hawkesbury; and Christian Schürmann, Sachsen Paper, presented and discussed their mill's experience working with Voith Fabrics.

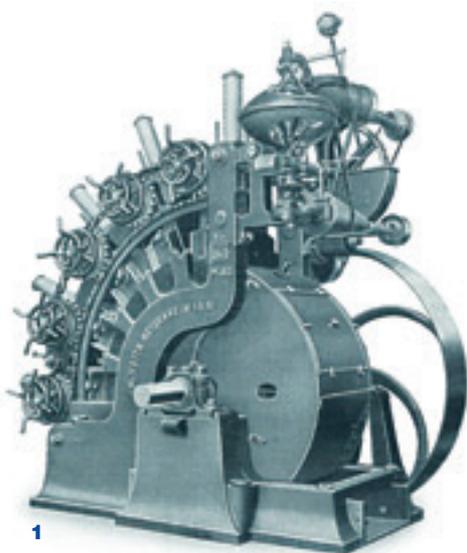
An exciting evening followed in the oldest beer cellars in Cologne, the "Gir Kellar". A typical Kölner-style buffet was served as customers and Voithians enjoyed music from a live band.

The following day was dedicated to touring the latest in high-tech machinery, Hürth PM 1 at Rhein Papier. Dr. Hans-Peter Sollinger, Member of Voith Corporate Board of Management, provided the welcome and highlighted the benefits of the synergy between Voith Paper and Voith Fabrics. Dirk Schwarze, Operating Manager, Hürth PM 1 provided the introduction to the tour and led over 100 guests through the high-class facility.

The successful two days in Cologne were a result of an ultimate synergy between Voith Fabrics, Voith Paper and the customer. Through verbal follow up, the sales managers have reported customers were impressed with the teamwork shown throughout the presentations and dialogues from Voith Paper Technology. Showcasing of the latest Voith Fabrics innovations reminded all who attended that extreme conditions demand extreme fabrics.

New grinders from old – Automation of 50-year-old Stone Grinders

Voith Paper recently received an order from VIPAP in Krsko, Slovenia, for converting seven continuous grinders to TGW (Thermo Ground Wood) grinders. In the course of modernizing their raw materials supply system, VIPAP will concentrate on ground-wood and DIP in future, because pulp production has been stopped for environmental legislation reasons.



The scope of supply includes not only TGW installations and rebuild components, but also the process control and C&I engineering, complete automation and various services such as erection supervision and commissioning.

Wood grinders have a long life! Although these old machines type IIIET and VET date back to 1952-1962, their output after rebuild will reach 170 t/day of high quality groundwood.

The stone groundwood process produces characteristics of fines that are essential for meeting paper surface requirements. Therefore, groundwood is a very important raw material for the paper industry.

History of stone grinders (Fig. 1)

The first stone grinders in Germany date back to 1852. Over the next 150 years they were continuously improved to increase production output and enhance stock quality. The basic principle, however, has remained practically unchanged:

wood is pressed against a rotating grindstone, whose surface is cleaned and cooled by water simultaneously. Out of the different kinds of grinders developed in the meantime, only the chain grinder, operating at atmospheric pressure, ensures a continuous groundwood output. This type of grinder was developed in 1919 by Voith and was first used at the Schongau paper mill, Germany, in 1921.

Grinder automation (Fig. 2)

Grinder automation centers on a Simatic S7-414-3DP programmable logic control (PLC) with 800 input/output signals for process interface. In total, 270 electrical and C&I control loops are programmed and visualized on 20 operator displays. The monitoring is carried out on a PC workstation using WinCC visualization software. Comprehensive new instrumentation for the grinder and periphery is included in the scope of supply. The seven grinders are now controlled entirely from the operator station.

This new automation system includes the following features:



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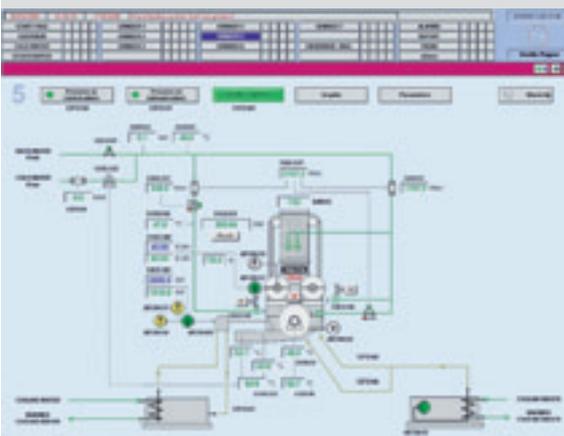
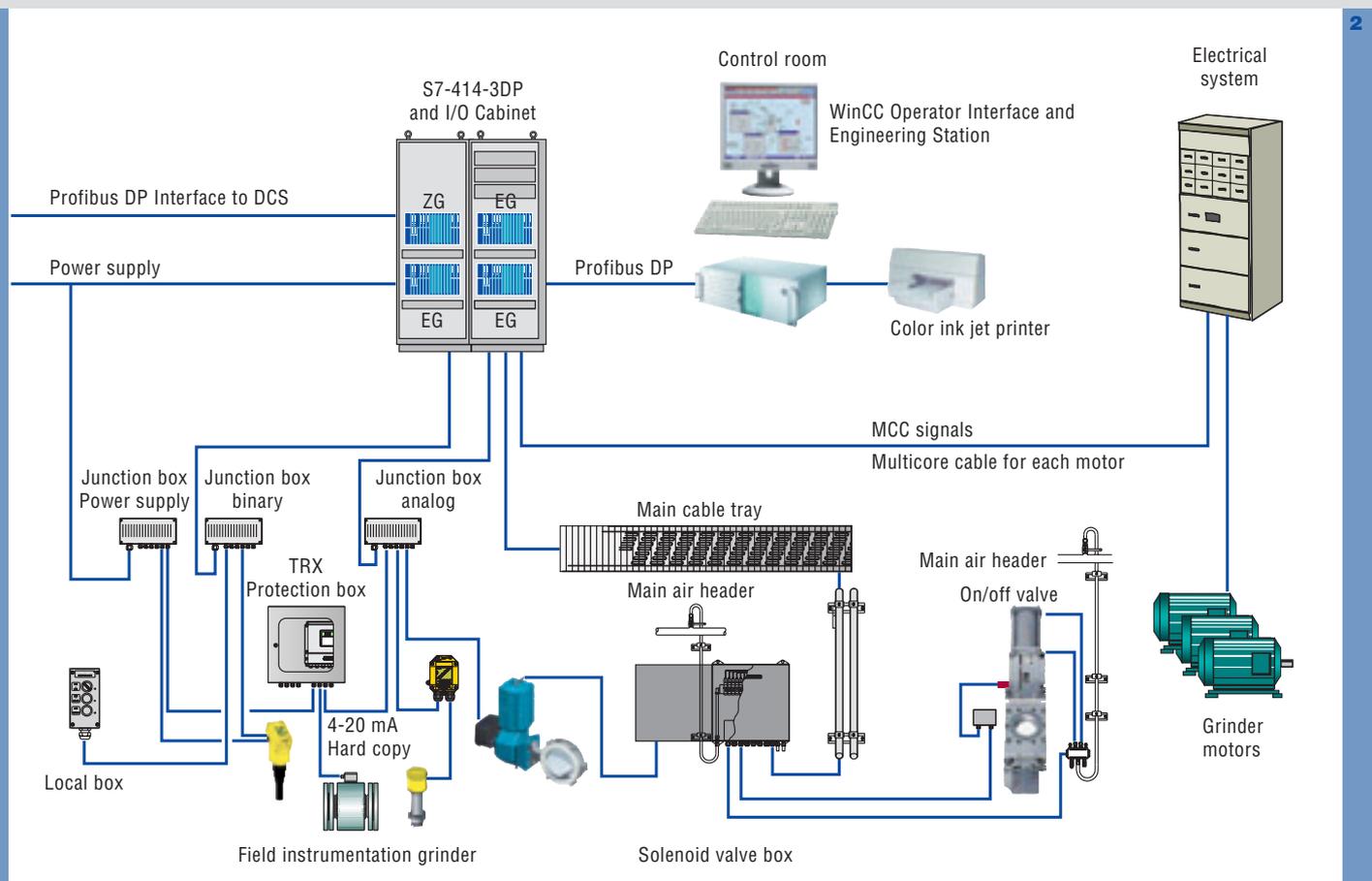
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Fig. 1: The first Voith stone grinder.

Fig. 2: Overview of grinder automation system.

Fig. 3: Grinding process control display.

	Production output	Grinding quality
Constant power control	++++	+
Constant production control	+++	++
TGW control	++	+++



- 3
- Automated group start and stop of each grinder
 - Control displays for the grinders and for the water supply system
 - Individual control per Electrical and C&I loop via OCX multitasking windows
 - Trend display and reporting system with energy reporting
 - Alarms and diagnostics for the control system
 - eDoxx online documentation system at

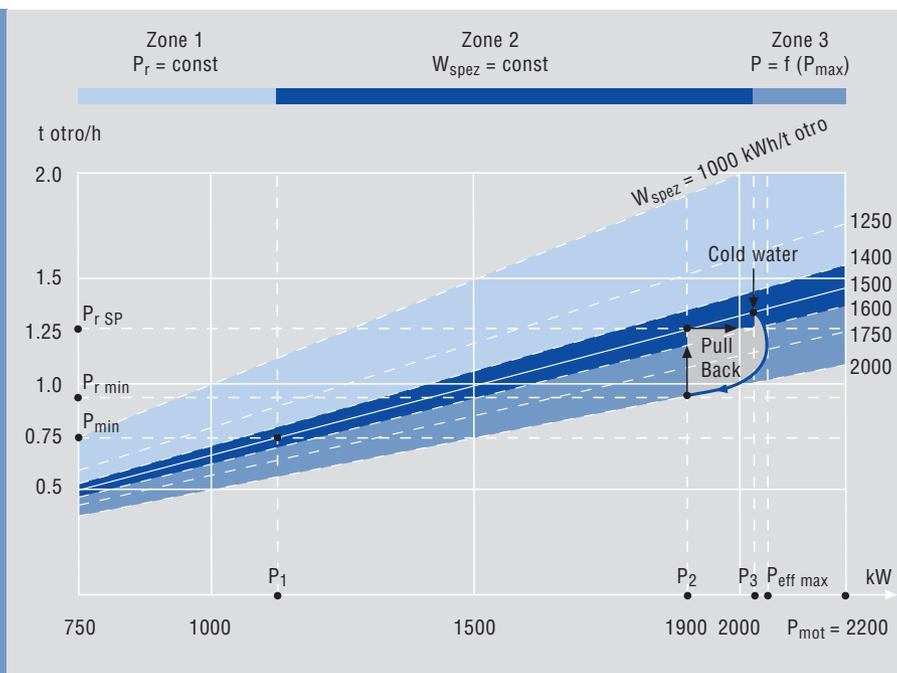
the operator station for mechanical, electrical and C&I documentation

- Three control programs with specific parameter display, as described below (Fig. 3).

There are three kinds of control mode:

- Constant grinder power control
- Constant production control (measured in tons oven-dry/24 h)
- TGW control for constant specific energy (in kWh/t.o.d.).

Fig. 4: Continuous grinder control chart.



The table on page 65 above compares these three control modes in terms of production output and quality, where the number of “+” signs indicates the respective weighting.

TGW control mode is the best solution with regard to consistent groundwood quality, followed by constant production control. In most cases constant power control is only used where high production rates are the main requirement.

What is TWG control mode?

TWG control mode is based on constant specific energy consumption (W_{spez}). Continuous measurements of power consumption and calculation of the produc-

tion rate are indispensable for precisely determining the specific energy consumption.

Grinder operating behaviour can be divided into three typical zones (Fig. 4).

Zone 1: $P_{\text{eff}} < P_1$

Operation at constant feed. Specific energy consumption $W_{\text{spez,calc}}$ is below the $W_{\text{spez,SP}}$ setpoint because the power consumption is too low or the grindstone is too sharp. In this zone the grinder is, therefore, operated at constant feed $P_{r \text{ min}}$. This condition usually occurs after grindstone sharpening, and constant feed mode enables troublefree transition back to normal operating condition (Zone 2).

Zone 2: $P_1 < P_{\text{eff}} < P_3$

TGW control mode (W_{spez}).

Both output and power consumption exceed the parameter settings $P_{r \text{ min}}$ and P_1 in this zone, where constant W_{spez} control is used. The power setpoint value P_2 , calculated from the desired production rate and the necessary energy consumption, is an important control parameter here for correlating feed chain speed and production rate.

Zone 3: $P_{\text{eff}} > P_3$ (overload range)

If power consumption exceeds the upper limit P_3 , constant energy control is replaced by dynamic power control. The special feature of this power control mode is a response function to prevent excessive log compression from the out-set. This works by reducing the chain feed rate to comply with a given power consumption setpoint continuously computed from the equation:

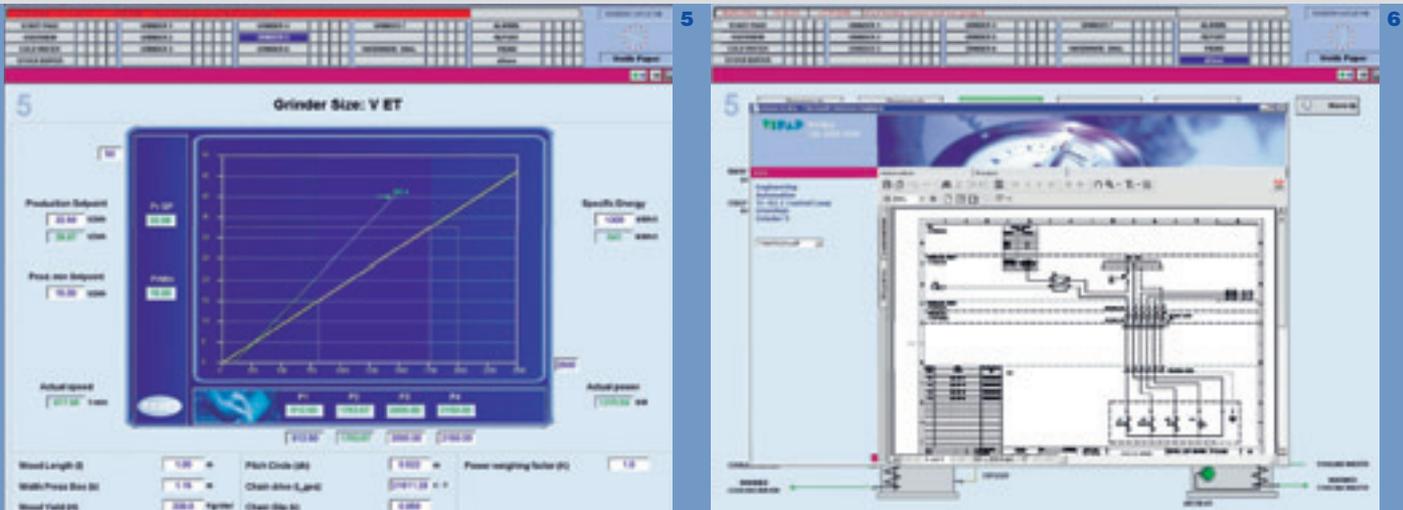
$$P_{\text{calc}} = P_{\text{eff}} - (P_{\text{eff}} - P_2) \cdot k.$$

After exceeding P_3 , the response function follows this continuous setpoint reduction until the power consumption has fallen to P_2 again or slightly below (Fig. 5).

The biggest challenge for us was to implement this control system, because it meant exploiting the entire available know-how on continuous grinder operation. We received decisive support in this connection from Hans Henrich during the

Fig. 5: Parameter display – grinder control.

Fig. 6: Documentation system with eDoxx browser.



course of numerous intensive discussions and interviews, right up to software testing and individual control program simulation. Thanks to this, the commissioning was smooth, troublefree and quickly completed. Now we can monitor the 7 grinders by remote control from Ravensburg, and make any necessary program changes or optimizations.

In addition to the automation, we installed a very useful maintenance documentation program known as “eDoxx”. This document browser developed by Voith is integrated in the control and visualization system.

The electronic plant documentation can be called up directly on the control screen. It contains the following :

- Maintenance and operating manuals with setting instructions for the

machinery and Electrical and C&I units

- P&I diagrams, energy balances and consumer listings
- Logic diagrams, loops and listings for the C&I and process control systems
- Plant and operation descriptions.

This gives fast and easy access to the entire documentation for troubleshooting and training purposes (Fig. 6).

Summary

Many well-known papermakers depend on groundwood as a raw material, because its high fines content enables good printing quality on SC and LWC grades. For this reason more and more groundwood producers are upgrading their machinery for higher performance and greater production capacity.

Compared with other control concepts, the revised TGW control offers some significant advantages:

- More stable operation than in constant power or constant feed control mode, thanks to constant specific energy consumption
- Longer grindstone life because less sharpening is required
- Consistently good grinding quality
- Better grinder control because deviations from operating setpoints are counteracted faster.

Apart from general refurbishing and automation of stone grinders, Voith Paper also offers a selection of second-hand grinders. For more information please visit www.voithpaper.com / e-business.



GAW as New Strategic Partner – Voith and GAW join forces

By taking over Jagenberg Papiertechnik, Voith also acquired a 20% participation in GAW-Pildner-Steinburg GmbH Nfg & Co KG of Graz, Austria. GAW and Voith see this as a strategic partnership with high synergy potential, and plan to strengthen it in future with mutually complementary systems and technologies.

Intensive cooperation

Against the background of a growing market demand for complete single-source solutions, the partner companies' interfaces and responsibilities will be clarified for more intensive cooperation in future. The resultant customer benefits not only include cost advantages, but also greater technical and technological security.

The first joint public appearance of Voith and GAW at the PulPaper Helsinki trade fair in June 2004 already provided an opportunity to make this partnership known on the market.

GAW – International plant engineering with tradition

GAW is long established in the international paper and board industry as a de-

signer and supplier of additives machinery, coating preparation, workstations and other periphery systems.

Founded as a private company in 1951 by the father of the two managing directors today, GAW's original business was the design and production of woodworking machinery. With the special valves subsequently developed together with Graz Technical University, GAW served the





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paper and board industry already in the fifties, and soon counted paper mills both locally and in neighbouring countries among its customers. Apart from valves, piping, tanks, pumps, etc. the first complete additive and chemicals plants (for alum, resin glue, etc.) were designed and built then and supplied worldwide as package deliveries with other machinery producers (including Voith). This successful cooperation in the past now forms the basis – strengthened by our capital participation – for intensifying teamwork toward a successful joint future.

Core competence: paper finishing

The trend toward coated papers in the following years was recognized in good time by GAW, that started developing

their own machines and technologies for preparing, storing and metering coating color. This business still focuses above all on mixing and dispersing, filtering and screening systems. The GAW technology offering today covers all equipment for the storage, preparation and metering of practically all the chemicals and additives, pigments and fillers used for paper and board finishing. Depending on the customer's needs, these systems, including process technology, are either supplied individually, as packages on a component basis, or as turnkey delivery.

Today GAW is active in all global markets, and its technology is featured in the majority of large reference projects. For example the coating preparation and pigment processing systems order for Dagang III at APP Gold East (Jiangsu) Paper Co. Ltd. in China was won by GAW against extremely tough international

Fig. 1: GAW headquarters in Graz, Austria.

Fig. 2: Coating preparation at Sappi Gratkorn, Austria.

competition. Already in 1998 and 2001 the coating preparation systems for production lines I and II were delivered.

New solutions and technologies are created both in GAW's own development department and together with national and international research facilities as well as customers and other partners. For example, GAW is co-founder of the VESTRA coating test facility in Munich, which enables GAW and its customers to test new processes and improve existing ones over a wide application range.

GAW International

Apart from Graz and Kapfenberg in the Steiermark, Austria, GAW also has its own independent subsidiary in Chicago, USA that looks after the entire North, Central and South American market. GAW also has a branch office in South Africa, and is currently building up an organization in China to serve the Asian market.

The Graz headquarters serve not only the paper and board industry but also the chemical, automotive and textile industries, and is additionally concerned with environmental technologies mainly combating water pollution.



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“A line of types”

150th anniversary of the birth of Ottmar Mergenthaler

In 2004, both the Old and the New Worlds celebrate the 150th birthday of Ottmar Mergenthaler. He was responsible for developing the newspaper industry’s first efficient typesetting machine. Faster typesetting helped newspapers to get the news out more quickly and in greater detail, and the paper industry has him to thank for the rapid increase in demand for newsprint.

At the end of the 20th century, American journalists chose their Man of the Millennium. It was not Albert Einstein or Bill Gates – but Johannes Gutenberg. How right they were! What moved the world on from the Middle Ages into the modern era was the invention of movable letters and the letterpress. Without the printed and published word, would the Reformation, the Enlightenment and the development of human rights have been possible, or would the free press ever have assumed its modern-day role within democracy?

Viewed in this light, the name of Ottmar Mergenthaler also deserves a place alongside that of Gutenberg in the history of the print media. Mergenthaler's ideas led to the introduction of highly efficient typesetting machines with a typewriter-style keyboard that replaced Gutenberg's laborious method of setting type by hand, which had remained unchanged for centuries. Manual typesetting – inserting letters, lines, spaces and columns by hand – had for many years been the main bottleneck in the printing process. Around 200 inventors on both sides of the Atlantic had already invested a great deal of time and money in trying to find a satisfactory solution – to no avail.

The author Mark Twain invested almost all of his savings in a typesetting system. It worked, but was far too complicated, so that in due course he lost everything. Mergenthaler was the first person to hit upon the right approach. With his typesetting machine, it finally became possible to fully utilize the capacities of the newly developed high-speed printing machines and web-fed rotary presses. Who



Fig. 1: Linotype typesetting machine.

Fig. 2: The house where Ottmar Mergenthaler was born.

was this brilliant German engineer? How did he come up with his idea? How did he find success in the USA?

Ottmar Mergenthaler was born on May 11, 1854 in Hachtel near Bad Mergenheim in what was then the kingdom of Württemberg in southern Germany. His mother died when he was still young. His father, the village schoolteacher, later married the sister of a friend, who was a clockmaker. The family of six lived in extremely modest circumstances.

The young boy dreamed of becoming a mechanical engineer or a “maker of mathematical instruments”, but his family could not afford to support him in this ambition. In 1868 he began an apprenticeship in his step-uncle's workshop and, in 1871, qualified as a watchmaker.

Despite his outstanding references and excellent achievements, his prospects in southwestern Germany, with its agriculture-based economy, were extremely poor. The recent Franco-Prussian War had resulted in radical social change, and brought unemployment and poverty in its wake. A fifth of the population of Württemberg was forced to emigrate. The Swabians were the largest group of German-speaking emigrants in history; the majority of them moved to America. Among their number was the 18-year-old Mergenthaler. His passage on the ship was paid for by his cousin August Hahl, who had already moved to Washington and was making a living by constructing electrical and mechanical instruments.

Mergenthaler arrived in Washington, where the headquarters of the US Patent

Fig. 3: *Ottmar Mergenthaler.*

Fig. 4: *A mechanically typeset and cast line of type.*

Fig. 5: *The first edition of the New York Tribune to be set with the Linotype machine.*

Fig. 6: *Mergenthaler's birthplace, the picturesque village of Hachtel near Bad Mergentheim in Baden-Württemberg, Germany.*



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Office was also located, in 1872. The Office's strict regulations insisted that certain patent applications had to be substantiated by a working model. Enjoying, as it did, a fine reputation as a specialist model-maker for inventors, his cousin's workshop was a hive of activity. There was plenty of work for the skilled watchmaker and would-be engineer from Swabia. Mergenthaler became the company's general manager in 1874.

In 1876 he met Charles T. Moore, who commissioned him to design and build a typesetting machine for lithographic transfer based on his patent specification. Mergenthaler improved the design and built the equipment to the satisfaction of his client. This project brought one of the printing industry's major problems to his attention, namely that there were no efficient and reliable typesetting machines on the market. Producing such a machine was to occupy him from then on. He sought out and studied all the research available at that time, analysed its strengths and weaknesses and came to the conclusion that the answer was not

individually formed letters but full column widths of type created from matrices assembled by machine and then cast. This was a completely new method that nobody had considered or attempted before.

Mergenthaler left his job with August Hahl to devote himself exclusively to the development of his typesetting machine concept. In 1882 he established his own workshop in Baltimore Bank Lane and found a financial backer, the lawyer L. G. Hine, who was convinced of the eventual success of the project. On 26 July 1884, Mergenthaler presented the prototype of his typesetting and line-casting machine to a small circle of interested parties. In 1885, an improved version was demonstrated to the American President, Chester A. Arthur, in Washington. In the same year, Mergenthaler also patented his invention in Germany.

The publishing industry was impressed, but Mergenthaler none the less remained critical of his creation and continued to develop it. In 1886, he developed the

"Blower". As its name implied, the Blower used blasts of compressed air to move the matrices into the assembler. In July of the same year, the New York Tribune was typeset for the very first time using the "Blower". A new, distinctive name for the machine and for the company was taken from an enthusiastic exclamation uttered by publisher Whitelaw Reid when confronted with this new technology – "A line of types!" – Linotype.

The Linotype typesetting machine

was quickly adopted by all the major American publishing houses. The New York Tribune ordered thirty, which saved it £ 80,000 a year – an enormous sum at that time – in typesetting costs. The Chicago News bought twenty Linotypes, the Courier Journal in Louisville eighteen and the Washington Post sixteen. The American Newspaper Publishers Association (ANPA), founded in February 1887, actively supported and promoted the Linotype and its continued development.

In 1889, Mergenthaler unveiled his last and best Linotype, the "Simplex". With



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its pillar base and skewed matrix magazine system, this was to be the final version of the machine. Its basic operating principles were retained for over three quarters of a century until lead-cast letters began to be replaced by photosetting. In 1890 Linotype received orders for more than one hundred "Simplex" machines. By the end of 1892, there were a thousand Linotype machines in use in the USA.

Ottmar Mergenthaler returned to Germany in 1892 to see his father. His invention gradually found its way across the ocean to Europe. In 1893 *De Nederlandse Financier* in Amsterdam was set for the first time on a Linotype, whereupon the newspaper's typesetters went on strike, delaying the appearance of the

next edition by five days. Despite such protests, nothing could stop the progress of machine typesetting and the technical and commercial benefits that it had to offer. Shortly after establishing a subsidiary in England in 1896, Mergenthaler's company opened a factory in Berlin. In 1897 the *Leipziger Neueste Nachrichten*, the *Hamburger Neueste Nachrichten* and the *Münchner General-Anzeiger* became the first German newspapers to introduce machine typesetting.

Ottmar Mergenthaler's ceaseless efforts and selfless dedication in pursuit of his idea eventually took their toll of his health. He died of lung disease on October 28 1899 in Baltimore at the early age of 45, and was buried in Landon cemetery.

The American newspaper industry has much to thank him for. His Linotype machine was the key to the introduction of more timely, in-depth reporting and encouraged greater competition to win readers by delivering high quality journalism. The newsprint and international printing industries also owe him a debt of gratitude. Without faster typesetting, it would not have been possible to increase newspaper circulations or expand the range of books, magazines and promotional materials on the market. In Hachtel, just an hour by car from Heidenheim and Voith Paper's head office, the entire village is preparing to celebrate the 150th birthday of their most famous son in the manner that they feel he deserves.

Manfred Schindler

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Newsmagazine for the international clientele, partners and friends of Voith Paper Technology

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NEW-YORK, SATURDAY JULY 3, 1886

TEN VICTIMS OF THE DYNAMITE

ONLY SMALL BITS OF THE BODIES FOUND.

A SCULDED OF THE ATLANTIC COMPANY...
Enough bits of human bones were found to be buried at 7:30...
The Atlantic Dynamite Company...
The bodies were found in the...
The explosion was a...
The bodies were found in the...
The explosion was a...
The bodies were found in the...
The explosion was a...

THE LATEST RETURNS

THE RESULTS OF THE LATEST RETURNS...
The results of the latest returns...

THE WAR CARRIED INTO CLATER

THE WAR CARRIED INTO CLATER...
The war carried into Clater...