Hans Müller

Dear Customer, dear Reader,

On October 1st this year it will be 10 years since Voith and Sulzer joined forces in the field of paper technology. The new company called Voith Paper has developed nicely and convincingly in the eyes of the pulp and paper industry. This is positively supported by a study recently performed by an independent consultant.

In our last twogether Magazine No 15 it was reported that our business year 2001/ 2002 performance was satisfactory with the exception of order intake. Since this report our backlog has improved considerably. Several large rebuilds were booked in addition to 6 complete paper and board production lines.

Two new lines, one for the production of towel and the other one for super soft tissue were awarded to our Joint Venture Voith Andritz in Janesville, USA.

At this point it appears that the 10th year of "new Voith Paper" could well develop into one of the best ever as far as order intake is concerned.

Moving the Voith Fabrics headquarter from Raleigh, North Carolina, to the heart of Voith's R&D world in Baden-Württemberg underlines our efforts to grow this important unit within Voith Paper Technology through innovative products.

Our focus of growth through participating in the consolidation of suppliers to the paper industry has been shifted to growth through innovative products and processes. The latest testimony to this is the order we received for the Leipa mill near Berlin. One of the fastest and widest LWC production lines using mainly recycled fibers.

We appreciate the continued support Voith Paper and Voith Fabrics receive from its well established customer base worldwide.

"Engineered reliability" from Voith seems to pay-off.

Hans Müller
on behalf of the Voith Paper Technology team.

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Another milestone in our longstanding partnership with Langerbrugge Mill, Belgium –

Voith supplies key components for the new PM 4 DIP plant

Herbert Gray

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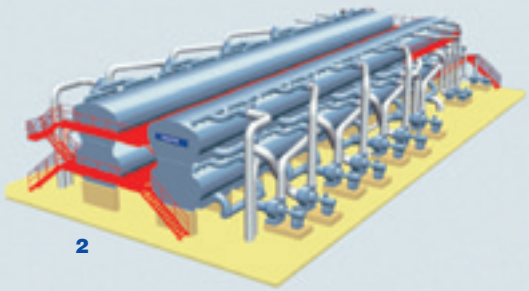
Voith's long tradition of partnership with Stora Enso Langerbrugge Mill goes back to the PM1 delivery about 70 years ago. Almost half a century later Voith installed Langerbrugge's first deinking plant in 1978, followed by PM 2 in 1984 and the PM 1 rebuild in 1985/86. Several DIP capacity expansions and technological improvements in the nineties set further milestones in this teamwork.



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In the meantime Langerbrugge Mill belongs to the Stora Enso Group. By ordering key components for the new PM 4 production line, Stora Enso confirmed their ongoing confidence in Voith deinking technology and know-how.

This is already the Stora Enso Group's eighth Voith flotation plant in Europe.

The project

The new PM 4 newsprint line commissioned in Spring this year is one of Europe's largest, with an annual production capacity of around 400,000 tons per year. The raw material is 100% recovered paper collected mainly within a radius of 300 km, an area where nearly 80 million people live.

Figs. 1 and 3: *EcoCell pre-flotation and post-flotation lines 1+2 in double-decker design.*

Fig. 2: *3-D model of PM4's EcoCell flotation plant in Langerbrugge.*

Fig. 4: *EcoDirect disperger.*

Fig. 5: *Sami S. Pitkänen (left), L4 Project Manager and Markus Mannström (right), Area Manager DIP L4 Project, Stora Enso, Langerbrugge.*

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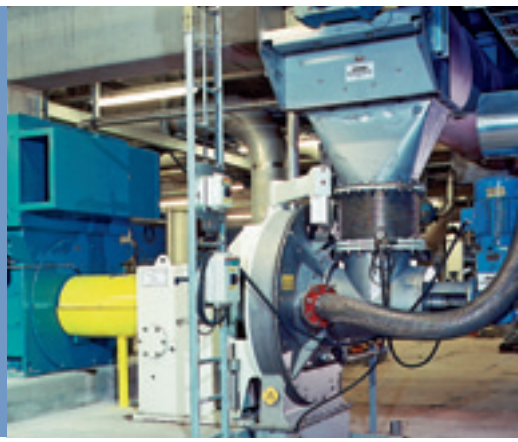

Including the new PM4, the Langerbrugge mill now processes about 700,000 tons per year of recovered paper into high grade newsprint and SC paper.

Voith's scope of supply

The contract covered EcoCell flotation for each of two parallel pre-flotation and post-flotation lines. Two EcoDirect disperger systems are also part of the Voith scope of delivery.

Based on a total plant capacity of 1260 t/24h, the pre-flotation line is designed for 2x735 t/24 h and the post-flotation line for 2x666 t/24 h. This makes Langerbrugge the biggest capacity flotation plant ever built by Voith for a new installation. If the cell lines had been arranged one after the other instead of in double-decker design in parallel, the total length would have been almost as long as two football fields.

The flotation system itself principally comprises the cells themselves, flotation pumps, internal pipework, deaeration cyclones and walkways. A particular feature from a technological point of view is the system's optimum mainstream aeration.

The disperging system, comprising two dispergers each with equalizing and dilution screw, is designed for a capacity of 2x679 t/24 h.

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Voith's contract responsibility also included complete erection, customer personnel training, and supervision of commissioning for its equipment.

Contract management

Following a kick-off meeting at the end of January 2002, erection work on the flotation plant started only six months later at the end of July. One reason for this particularly fast schedule was the few but highly efficient project meetings for defining interfaces and handover points. Another reason was Voith's process and automation engineering input, which fitted perfectly into the overall engineering schedule.

With the support of Voith's partner DIW Indumont, the erection work was completed by Voith to the customer's complete satisfaction within a very short space of time.

1

Voith Paper AS in Tranby/Norway – our Competence Center for innovative dewatering technology

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Voith Paper AS in Tranby, Norway is Voith Paper Fiber System's Product Center for dewatering. The company is very well-known for its dewatering machines, such as Thune screw presses and Thune disc filters.

Backed up by quite a number of innovations over the past few years, Voith Paper has developed into the accepted technology leader in dewatering. Development has focussed on two main areas:

- Increased capacity and efficiency for a given size of machine and
- Increased availability and lower maintenance costs.

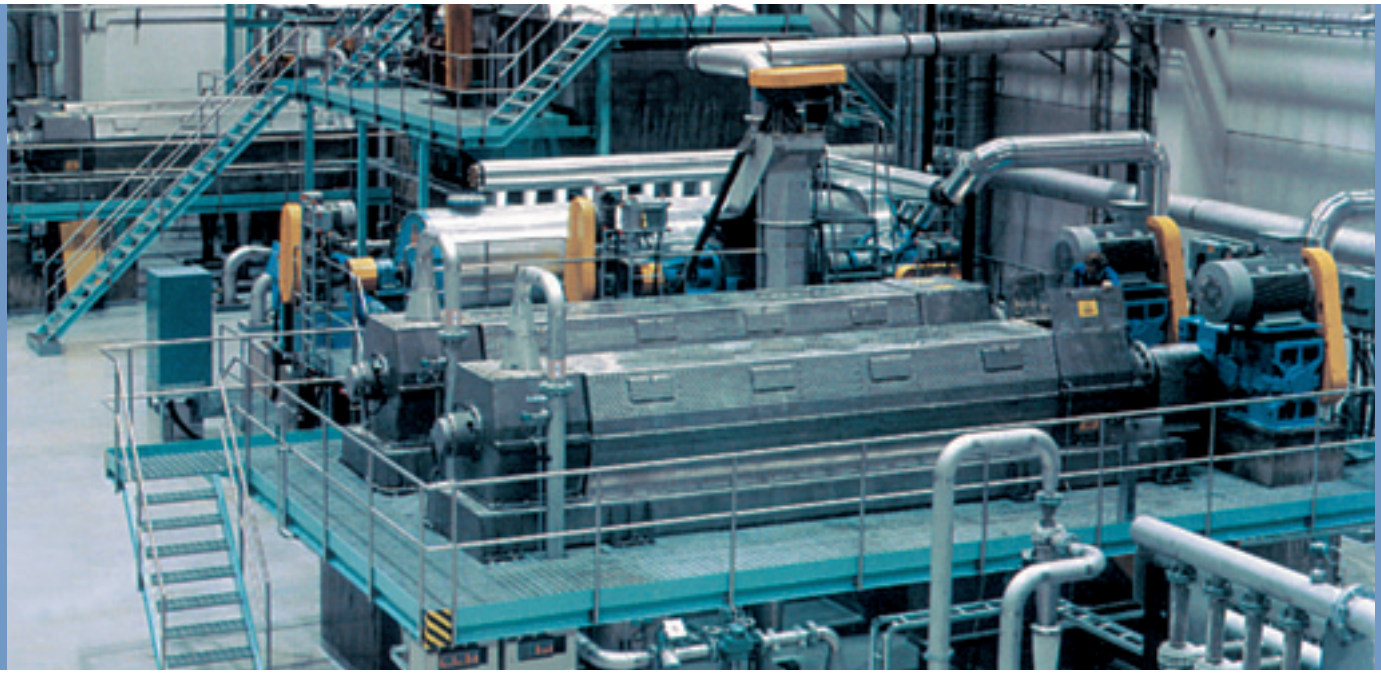
Although these two objectives generally need to be handled separately, when combined they provide a true technological leap forward.

Thune presses – tradition and innovation

The history of Thune screw presses dates back to the early 20th century. The presses became the paper industry's standard during the late seventies and early eighties, mainly due to their flexibility of application, compact floor space and low maintenance costs, compared with competitor machines. In many parts of the world the name "Thune" is synonymous with screw presses irrespective of the make, although Thune is a Voith Paper trade name.

Fig. 1: *Knock-off of the pulp mat from retrofitted Bagless discs in a disc filter installed in an OCC line.*

Fig. 2: *Typical Thune screw press installation in a deinking plant.*



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The fundamental principle of screws (and screw presses) was described more than 2000 years ago by Archimedes. One can regard it as a simple machine, with just one moving part – the screw itself (Fig. 3). There is, however, a wide range of design-related parameters directly or indirectly influencing the overall operation of the press. Much of our recent research work has focussed on optimizing press design, while still maintaining the low power consumption of the original design.

This work has, for instance, resulted in an improved screw geometry called HiCap (Fig. 4). Every screw press has a customised design, optimised for each customer's specific operating conditions. Depending on press size, the improved geometry can provide up to 40% higher capacity, with increased outlet consistency and reduced power consumption at the same time.

The fact that the press screw alone accounts for these improvements means existing presses can be upgraded. Such upgrades are becoming increasingly popular since mills can improve overall efficiency and increase production beyond the original design capacity of their systems. Significant capacity increases can thus be achieved without the substantial investments normally required. Fig. 5 shows the improvements by upgrading the dewatering of TMP rejects in a Norwegian mill.

Increased availability and reduced maintenance costs

The operating principle of a screw press requires a certain amount of friction in order to form a solid plug in the outlet zone of the press. This friction inevitably leads to wear of the static parts, but especially the moving parts of the press. The screw flight is most affected and has to be rewelded at certain intervals depending on stock characteristics.

For very abrasive types of stock, this time-consuming rewelding procedure might have to be repeated as often as every four months, leading to substantial downtimes and high maintenance costs.

Fig. 3: *Design of the Thune screw press (standard version).*

Fig. 4: *The new HiCap- (High Capacity) screw.*

Fig. 5: *Comparison of operating data before and after installing a HiCap screw in an existing screw press.*

Fig. 6: *Wearless segments for increasing the life of screw flights.*

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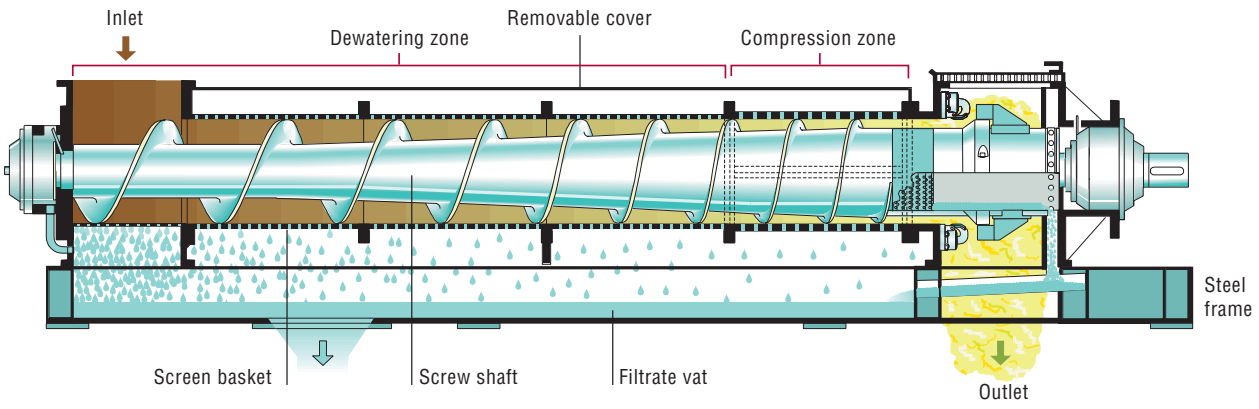

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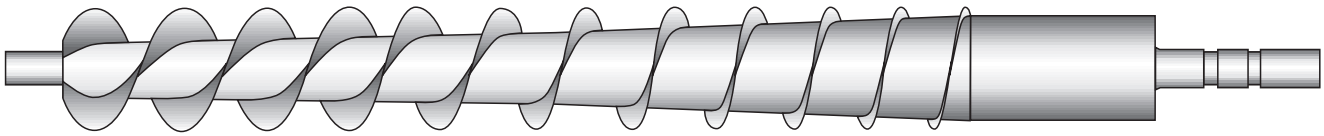

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	Before	After
Freeness (CSF)	400	400
Temperature (°C)	70	70
Production (t/24 h)	75	130
Outlet consistency (%)	35-39	35-40
Speed (min^{-1}) (Fixed speed drive)	42	42

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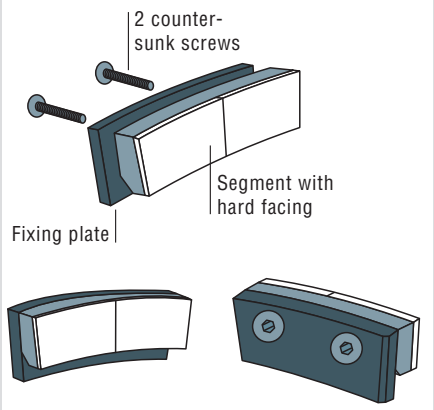


In order to provide a more efficient solution, Voith Paper has developed the Wearless segments which are attached to the screw flight by a patented method ensuring they not come loose **(Fig. 6)**. A wide range of wear surfaces were tested. Ceramics have proven to be the best material in terms of wear resistance but have the disadvantage of being brittle and susceptible to breakage if subjected to pointed or abrupt forces. Sintered hard-facing has so far proven to be the best compromise between wear resistance and mechanical strength, but traditional hard facing is also available.

By upgrading presses with Wearless technology, the intervals between screw flight resurfacing have increased by a factor of up to 6, and the shutdown time required to do the job is reduced by a factor of up to 10. This technology therefore provides a dramatically improved availability.

Recent improvements in disc filter technology

One very important technological breakthrough for Voith Paper AS was the launching of the “Bagless” technology. Conventional filter bags are no longer required. This patented special profiling of the disc filter sectors significantly reduces shutdowns and the costs for wear material.

The Bagless sector **(Fig. 7)** consists of two corrugated stainless steel plates with a fine perforation. The plates act as the filtering media. This technology offers an

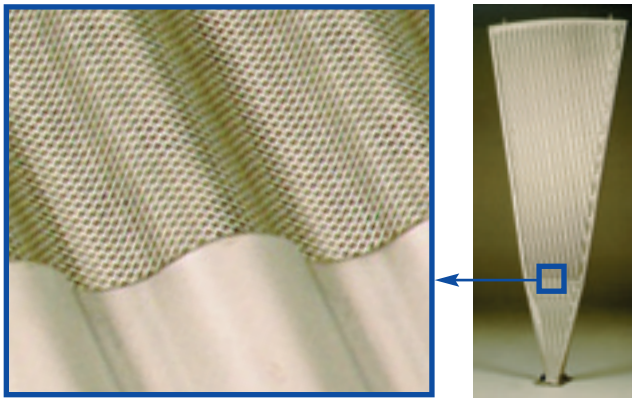
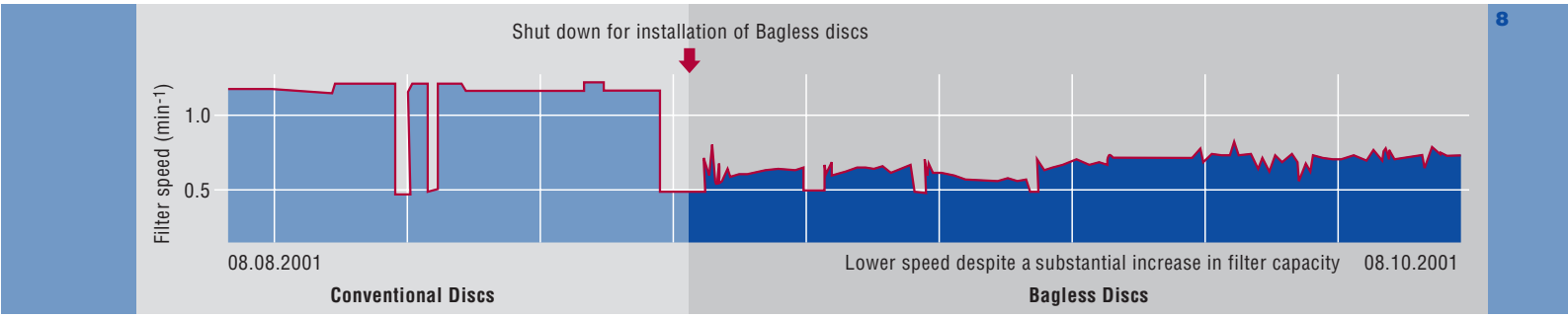


Fig. 7: *Bagless sector with close-up view.*

Fig. 8: *Comparison of disc filter speed before and after installing Bagless discs in a disc filter at UPM-Kymmene, Shotton, Great Britain.*



even higher specific filtering capacity per area, compared with conventional filter bags. This means no more shutdowns for replacing worn bags, thus saving both time and money. In addition, mills avoid the risk of a higher fiber content in the filtrate when bags are damaged. Plastic bag trash is also eliminated.

From pilot plant to industrial scale

The development of the new Bagless sectors began in our pilot plant in Tranby, Norway where these new corrugated sectors were extensively tested on our pilot disc filter. While providing the same filtrate qualities as conventional discs, the first trials showed very promising results for higher capacity as well as a high pulp mat consistency.

Several discs were trial run in various paper mills and the first complete retrofit was undertaken at SCA Obbola, Sweden in December 1999. A disc filter was upgraded with new filtrate valves, centre shaft and all discs were replaced by Bagless discs. The disc filter dewaters OCC stock in a long fiber line and has been running to full satisfaction since start-up three years ago. A higher capacity and an excellent finished stock consistency have been achieved.

The next retrofits were two Thune disc filters dewatering ONP/OMG stock at UPM-Kymmene, Shotton, Great Britain. These were originally delivered with conventional discs in 1998. This was the best opportunity to obtain a mill comparison between conventional and Bagless discs. All the conventional discs were replaced by Bagless in both loops. We installed 10% fewer discs in both filters compared with the original filters with conventional discs. The results were astonishing **(Fig. 8)**. The filter speed in Loop 1 dropped from 1.25 min^{-1} to 0.65 min^{-1}, yet the filtration capacity per disc increased significantly!

Fig. 8 shows the trend line from the DCS showing the filter speed for a period of two months. Similar results were obtained for the filter in Loop 2. The speed was so low that the pulp mat was thick and substantially dry and filtrate quality had improved considerably. Even when a few discs were removed the filter could still handle the flow. Two years after the installation of Bagless discs at Shotton, the mill remains very satisfied with the results.

Improved filtrate quality

The major concern from paper mills is the size of the perforation, which is obviously bigger than with conventional bags. In the dewatering cycle the perforated plates or bags provide the filtering media only during the first few seconds. As soon as a pulp mat starts to form, the pulp mat itself becomes the filtering medium, not the plates or bags. The pulp mat has a much smaller open area than a conventional bag.

Another successful installation was the upgrading of a saveall filter to Bagless at International Paper in Saillat, France. The filter runs very slowly since the Bagless discs were installed in May 2002. Despite the high ash content, the quality of the clear and superclear filtrates is now even higher. Philippe Benoiton, Saillat's paper machine superintendent, commented as follows: *"We are never restricted by the capacity of the filter and at the same time, the filtrate quality has significantly improved. This is a great success."*

Smaller disc filters

At this point in time we were still very conservative in selecting the machine

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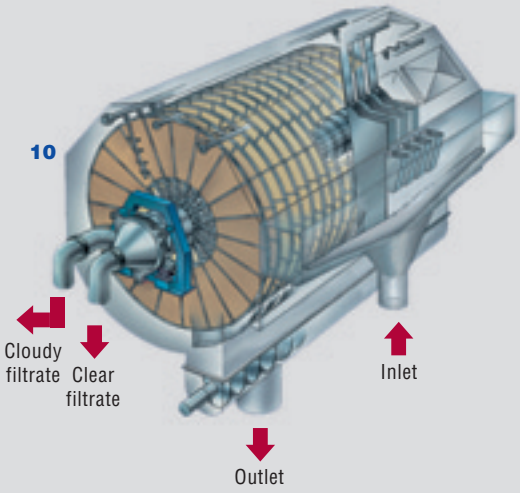
Fig. 9: *Typical Thune disc filter installation.*

Fig. 10: *Design of the Thune disc filter.*



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sizes, despite the significant increase in capacity provided by Bagless discs. In fact, with Bagless, smaller disc filters can be installed to handle the capacity in comparison with conventional bag filters. In other words, Bagless filters save mills space and money.

Future disc filter installations

Following these successful installations, more disc filters are being sold with Bagless discs than with conventional ones. It is now Voith's standard feature unless, of course, a customer specifically requests conventional discs. As of today, 33 complete installations with Bagless discs have been sold worldwide, on a total market size of some 160 filters. Eleven filters are already in operation, running as dewatering or saveall filters, handling TMP, ONP/OMG, Kraft, OCC and wet strength stocks. Four installations in North America handle TMP stock, while recycled/kraft stocks are the focus for installations in Europe and Asia. Nine Dragons in China bought a saveall filter with Bagless discs two years ago. They were so satisfied that they bought ten more Bagless disc filters at the end of 2002.

After every start-up the results have surpassed our expectations and customers are fully satisfied. Our research and development work on Bagless discs continues so that we can offer our customers even more efficient Bagless technology, including their suitability for upgrading competitors' disc filters. The overall aim is to increase manufacturing process efficiency.

Voith Paper is confident that Thune Bagless discs will be the trendsetter for disc filter technology in the future.

LEIPA-Schwedt PM 4 – large order finalized

Klaus Siebert

Paper Machines Graphic
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On May 15, in Voith's historic "Eisenhof" residence, the LEIPA Georg Leinfelder GmbH management board under Dr. Hubert Schrödinger signed a large order worth about 150 million Euro for the new Voith Paper machine No. 4 in Schwedt.

The PM 4 line is designed for producing 300,000 t.p.a. of coated magazin paper in the basis weight range of 39 to 60 g/m^2 from 70% to 100% deinked recovered paper. The wire width will be 8,900 mm, the maximum production speed 1,800 m/min.

Purpose of this new line is the large-scale production of standard LWC in consistently good quality and in any desired quantity, even at short notice. To meet this specification, Voith developed a cost-effective, custom tailored production line concept for seamless A-Z processing, from recovered furnish handling to finished paper roll packaging.

"LEIPA-Schwedt PM 4 sets the benchmark for production by partnership", says Voith AG Board Chairman Dr. Hans-Peter Sollinger. *"This line is based on our new PLP (Process Line Package) concept, whereby we take over responsibility for the entire production line and guarantee our customers exactly the end product they require. In our role as system partner, we team up with the customer from beginning to end – including*

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Fig. 1: *The LEIPA Georg Leinfelder GmbH and Voith Paper management delegations after contract signing.*

Fig. 2: *Harry Hackl signs the contract.*

Fig. 3: *Dr. Hubert Schrödinger signing the contract.*

Fig. 4: *Konrad Göbel talking with Kurt Brandauer.*

Fig. 5: *Impression of the new production line (blue) in Schwedt.*

Fig. 6: *Schematic layout of PM 4.*

process engineering – until all joint targets have been met."

This system partnership does not stop then either. Years after going on line, Voith Paper still keeps the customer fully competitive with state-of-the-art production line reliability and product quality.

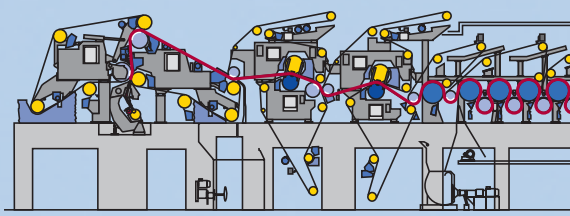
"Quality Tons on the Reel" means maximizing the cost-effectiveness of paper and board production lines. Optimal availability at maximum efficiency, optimal utilization of all furnish and other materials with consistently high product quality – these are the criteria for profitability. The **One Platform Concept** puts this Voith Paper philosophy into practice. By taking account of the entire papermaking process from furnish to end product, it ensures optimally cost-effective production lines for all kinds of paper and board. And it takes into account not only the papermaking process components, but also the production line life cycle. From the beginning, the One Platform Concept thus takes full account of product developments, production costs and services.

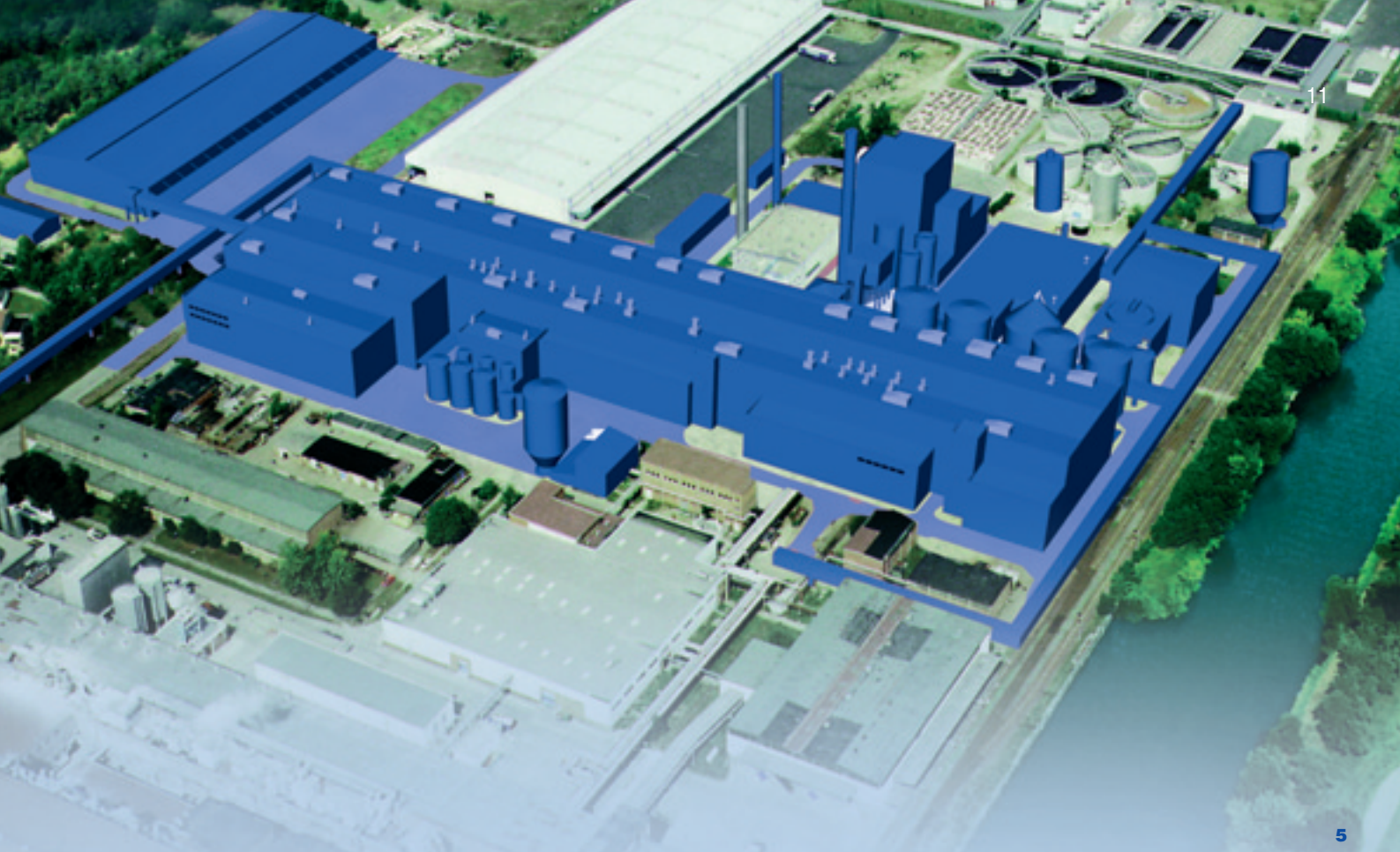
Voith is supplying all machinery and equipment for LEIPA-Schwedt PM 4, as well as **stock preparation line** engineering for 780 t/day of recovered paper. The machinery mainly comprises a twin-drum pulper, screens and dispergers, and the flotation units. Also included in the scope of supply are the components for recovered paper dewatering, pulp and furnish charging, bale dewiring and rejects handling. Apart from the recovered paper stock preparation line, delivery also includes a 150 t/day chemical pulp preparation line. The approach flow section incorporates cleaners, screens, whitewater tower and pumps.

First class formation is ensured by the **DuoFormer TQv** vertical former together with a **ModuleJet** headbox with dilution water control, the predominant headbox in the paper industry. The **Tandem NipcoFlex** press ensures maximum dry content and optimal paper quality. Also incorporated in this new PM 4 line is the state-of-the-art **TopDuoRun** drying technology.

Contactless tail pick-up from the last dryer cylinder, together with proven **Fibron vacuum technology** and high pressure water jet cutters, ensure optimal tail transfer.

The base paper is precalendered in an **EcoSoft Delta** calender prior to coating. The heart of the online coater is a **SpeedSizer**, which simultaneously coats both side of the sheet at 8 g/m^2. Automated coating thickness control **(Profilmatic C)** in machine and cross-machine directions ensures maximum process stability. The highly efficient coating line air drying system also ensures optimal web stabili-





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ty. An 10-roll **Janus MK 2** calender, installed online, meets the requirement for this LWC paper for excellent printability by ensuring high gloss and smoothness.

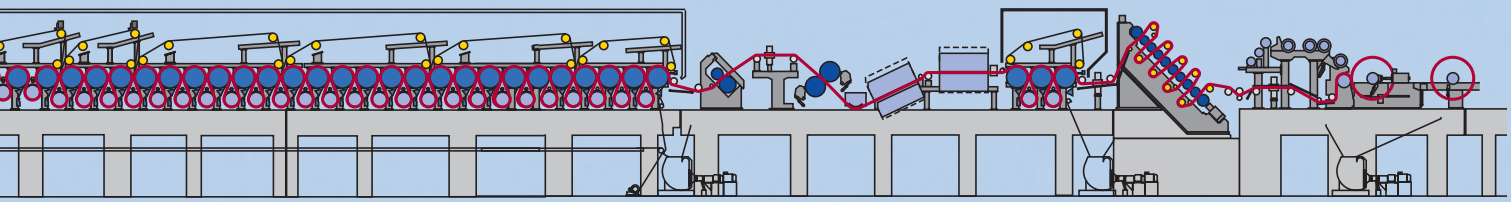
The **Sirius** slitter-winder system for winding paper rolls up to 3,500 mm dia. at speeds up to 2,000 m/min, is a trend-setting innovative development meeting the highest roll quality demands by implementing state-of-the-art winding technology.

Only one operator crew is required for the entire winding line – comprising full paper roll handling, two **VariTop** slitters, a **VariFlex** rewinder and a **Twister 2-line** roll packaging machine – because the roll slitters and roll packaging machine are fully automated. The two VariTop slitters with flying splice, automatic knife positioning and automatic roll change are designed for finished rolls, weighing ten tons each.

Voith is also supplying the entire PM automation system including comprehensive cross-profile control and **Enviro-Scan** moisture control. The Voith Machine Monitoring System gives early warning of any bearing damage or other problems. The scope of supply also includes web inspection system, sheet break analysis system, and the approach flow section measurement and analysis systems. During the design phase Voith will also be responsible for all the detail engineering for the automation of the paper machine including peripherals and stock preparation line.

Site construction work started on April 1, 2003. Erection will commence on March 1, 2004, with commissioning scheduled to begin on August 18, 2004 and production startup on August 31, 2004.

LEIPA Georg Leinfelder GmbH, owned by the Schrödinger family, was founded more than 150 years ago. In 1992 LEIPA took over the former papermaking cooperative VEB Papier & Karton, Schwedt an der Oder, and expanded this mill into the company's second largest after the traditional headquarters in Schrobenhausen, Upper Bavaria. The Schwedt mill produces uncoated and coated board, graphic LWC papers, and corrugated carton in brown and white grades. Annual output currently totals around 420,000 metric tons.



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Order Package from Stora Enso
for major rebuilds in Finland and Germany

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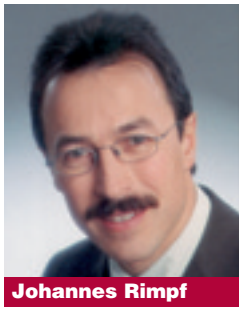

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On November 15, 2002, Voith Paper was awarded two major rebuild orders by Stora Enso with a handshake, one major rebuild of the BM 3 for Stora Enso Packaging Boards at the Baienfurt mill, Germany, and another major rebuild of PM 3 in Veitsiluoto, Finland. Stora Enso is among the world's leading forest industry concerns, with 43,000 employees in 40 countries, a production capacity of 15 million tons of paper and board, and annual sales of 13.5 billion Euro.

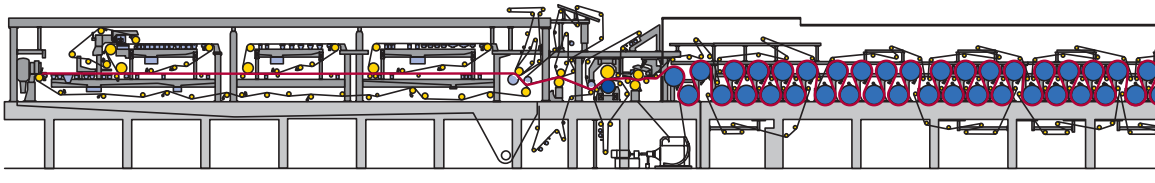
Baienfurt BM 3

By officially signing the contract on November 25, 2002, Stora Enso and Voith sealed their cooperation for the major rebuild of BM 3 in the Baienfurt mill. The board machine was originally supplied by Voith in 1970 and rebuilt several times in the past. The BM 3, with a wire width of 5,150 mm, an untrimmed width at the reel of 4,760 mm and a design speed of 850 m/min, produces board in a basis weight range of 160-380 g/m^2. Currently, the Baienfurt mill is producing 175,000 tons/year of high-quality coated board from virgin fibers for packaging, cigarette boxes and graphic applications.

The rebuild is a crucial challenge of the "Mission 2004", an investment project by Stora Enso Baienfurt to strengthen the location and the competitive situation. By boosting production to 210,000 tons/year, while enhancing the quality of the end product, Stora Enso Baienfurt will be optimally prepared for the future and continue to hold its leading position in the field of board production. The rebuild will also influence positively the accessibility and operability of the machine.

Time schedule

It is the mutually agreed upon goal to complete the rebuild in the shortest time possible. In mid-November 2003, the first pre-assembly work on site will start while the board machine is running. In early January 2004, the board machine will be shut down to carry out the rebuild. Within three and a half weeks between shutdown and restart, the major rebuild will be completed in early February.



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Main activities and components

The scope of supply includes the **rebuild of the** entire **press section**. The first press will be double-felted. The second press will be upgraded into a double-felted NipcoFlex shoe press for gentle drainage, while preserving bulk, and the third press will be rebuilt into an unfelted smoothing press (offset press) with new roll covers.

In the **pre-dryer section**, a new first dryer group and a fifth dryer group will be installed. The first after-dryer group will be designed as a three-tier dryer group ,followed by sweat dryers. The drying efficiency will be optimized by additional measures, such as the rebuild of the steam and condensate system, the installation of stationary siphons and blow boxes.

A special "highlight" of the rebuild in Baienfurt will be the introduction of the **NipcoFlex shoe calender technology,** which is a new development by Voith Paper. The calender has a very wide nip (up to 250 mm) and can be operated at temperatures above 250° C. Under these production conditions, the board quality in terms of bulk, stiffness, smoothness and printability can be significantly improved. The new NipcoFlex calender will allow the existing Yankee dryer to be removed later on, resulting in additional potential for increasing speed and output.

In the **coater**, the coating sequence will be modified according to the latest knowledge, and the coating equipment will be rearranged. The drying efficiency will be increased by installing two new Krieger hot air dryers, with the existing IR dryers being re-used. After the rebuild, non-contact web guiding and drying will be ensured, and, to achieve a higher safety level, a two rope tail threading systems will be installed.

For **wind-up**, the Sirius system with centerwinds and reel spool magazine will be used, allowing parent rolls of 3,500 mm diameter to be wound. The parent rolls are transported to the unwind of the winder by a transport cart with a turning device, the empty reel spools are returned fully automatically to the Sirius magazine.

The web transfer in the entire machine will be optimized, using Fibron systems and a rope system from the second after-dryer group to the Sirius reel. The scope of supply also includes the pertinent ancillary units as well as the complete hydraulic, pneumatic and electrical control systems, engineering, personnel training, installation and supervision of start-up.

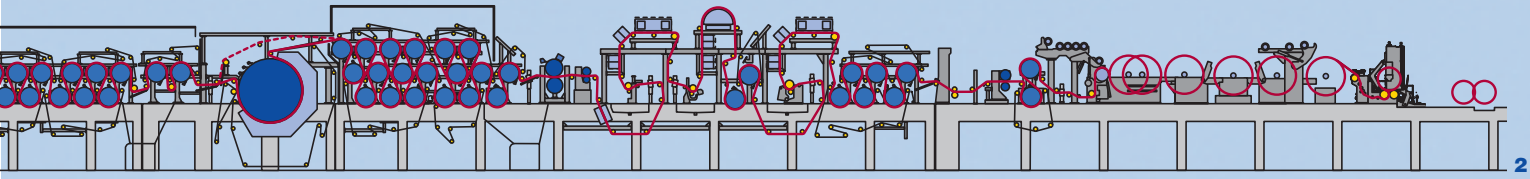
Helmut Endler

Project Manager of Mission 2004 at Stora Enso, Baienfurt

"Voith is known to be a reliable and innovative supplier of technology. For this project, Voith was chosen as the supplier because of the excellent performance characteristics, flexible project handling and rapid completion of the rebuild. In addition, the BM 3 is best known to them, and so we are convinced Voith is the ideal partner for the rebuild."

Fig. 1: *Stora Enso, plant Baienfurt, Germany.*

Fig. 2: *Scheme BM 3.*



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Veitsiluoto PM 3 – Voith leadership in Finland as well

Close teamwork on this project started even before placing the order on November 15, 2002 at the Stora Enso headquarters in Stockholm – for a paper machine rebuild at the world's most northerly mill near Kemi in Finland. A good many suppliers had repeatedly upgraded PM 3 in Veitsiluoto to the latest state of technology, but now practically the whole machine was to be replaced with new components. A challenging task for a challenging customer – *"We're not only the most northerly customer for paper machine suppliers, but also the most difficult!"*

The technical data of this "northern lights" paper machine can be summarized as follows:

- Product range:
  woodfree envelope paper 70-130 g/m^2,
  woodfree copy paper
  75-100 g/m^2
- Wire width 7,180 mm
- Operating speed 1,200 m/min
- Output 912 t/24 h

This rebuild includes installation of a new **dilution water line**, with **wet end controller** for high runnability and improved paper quality, and retention control for better CD and MD profiles. To minimize sheet breaks, the basis weight is monitored throughout the wet section as a function of stock consistencies, flows and machine data. This enables settings to be optimized for best possible operating conditions at all times.

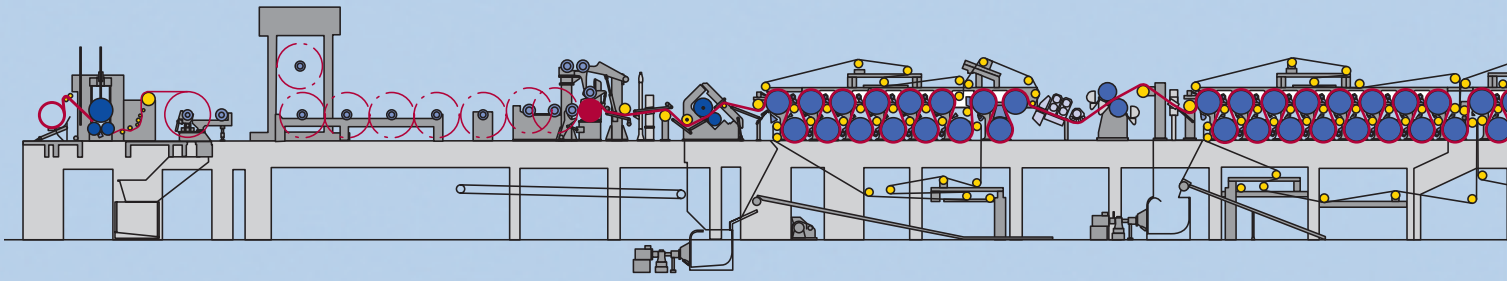
The **MasterJet F** headbox with ModuleJet ensures optimal basis weight distribution and fiber orientation. Thanks to the **Profilmatic M** control concept, CD profiles are consistently excellent, while lamellas in the nozzle improve turbulence characteristics to further optimize the paper structure.

A new fourdrinier section with **DuoFormer D** makes for good formation with minimum 2-sidedness and high drainage capacity. More than 200 formers of this type are now in well-proven service worldwide.

Thanks to a **DuoCentriNipcoFlex** press incorporated in the rebuilt PM 3, high dry content will be attained at good volume. This is the eleventh shoe press sold by Voith in Finland, and the entire press will be installed on steel foundations also supplied by Voith. Integrated in the press section is a **steam blow box with Profilmatic S** control system for consistently good moisture CD profile.

An **EnviroScan** right at the beginning of the dryer section displays the moisture profile after the press, and enables a short control loop to the steam blow box. Ropeless tail transfer ensures optimal web run through the entire dryer section, while **DuoStabilizers** make for improved shrinkage behaviour and narrower margins. Felt and wire changing devices, to minimize shut-down times, are also included. All the drying cylinders have to be overhauled, and this alone is a logistical challenge. The existing IR dryer before the afterdryer section is being extended to include an additional nozzle stabilizer.

Tail pick-up between the pre and afterdryer sections and between the after dryer section and the reel is performed by **8 Fibron VTT3000 belts** all in all.



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These ensure smooth transfer at all times, irrespective of basis weight and operating speed. The new Fibron belt technology, with drum motor in a belt turning roll and integrated vacuum generation by compressed air, saves space and minimizes maintenancetime.

The online 2-roll **EcoSoft-Delta calender** belongs to the latest Voith soft calender generation. Based on the successful Janus MK 2 principle, this type of calender with its 45° frame layout ensures quiet, smooth-running operation, free of vibrations. Fine sheet profiling is taken over by a plastic coated Nipcorect roll. An innovative feature of this calender is its swivelling dual console, on which all roll related elements are mounted, such as guiding devices, etc. For roll changing, the dual console is simply swung away to give direct access to the 45° roll stack. This eliminates the substantial time spent previously for removing and re-installing the components hindering the access.

Incorporated in the end section is a highly sophisticated **TR 125 reel**. This reel enables consistent winding by generating a solid core structure, thanks to variable line force control in the primary and secondary zones. Empty reels are fed from a fully automated magazine system. Together with the "goose neck" system, this ensures optimally dependable web transfer to the next empty reelspool.

The scope of supply also includes a **Vari-Flex M** two-drum winder with a working width of 6,500 mm and maximum operating speed of 2,500 m/min. This new slitter-winder (for copy and fine papers) is a state-of-the-art machine with butt-splicer, automated knife positioning system, automatic paper roll change and graphical user interface. The two winder drums – the first of which with well-proven MultiDrive coating, the second with tungsten carbide coating – work in conjunction with a specially coated feed roll to ensure optimal winding results.

Also included in the scope of supply are other components and units required for paper machine operation such as: central oil lubrication system, mechanical drives, machine air technology system with new hood, pulper, and conveyor belts.

Since the agreed standstill time is very short for a project of this magnitude, smooth coordination of all rebuild measures is extremely important. Only 53 days are available from paper to paper. To comply with this, perfectly planned and organized erection and commissioning are essential – as well as optimal logistics: about 6,000 tonnes of materials are required for this rebuild.

Thanks to a newly developed spare parts catalogue system, the customer can select all spare part components easily and rapidly. Paper machine components selected from a drawing or parts list on the monitor are electronically deposited in a "shopping basket" which can be called up from Voith at any time by e-mail.

It was due to the customer's confidence in our **"Engineered Reliability"** that Voith was chosen for this rebuild. Our combination of carefully matched and well-tried components with outstanding innovation made Voith the preferred supplier both for the Veitsiluoto and Baienfurt rebuilds (both were ordered together). And already after a very short time, a perfectly harmonized project team has been formed between Stora Enso and Voith.

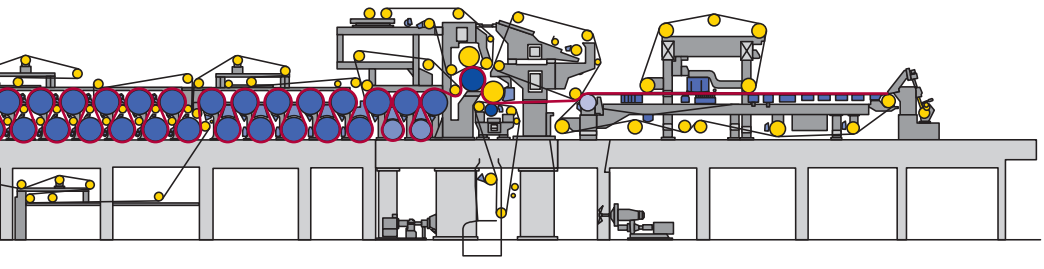

Fig. 3: *Stora Enso, Veitsiluoto mill, Finland.*

Fig. 4: *Layout of the PM 3 rebuild.*

Fig. 5: *Contract signing at Voith headquarter, Heidenheim, Germany.*

Varel paper and board mill – new paper machine increases production capacities

In mid-May 2003, the paper and board mill Varel GmbH & Co KG in Varel, Germany, placed an order with Voith Paper for the supply of the new paper machine PM 5 for the production of testliner and corrugating medium.

Together with the new PM 5, the Varel paper and board mill will operate in future two paper machines for the production of corrugated board papers and two board machines, using 100% secondary fibers as raw material. At present, the capacity of the mill in Varel is 400,000 tons per year, with approx. 230,000 tons per year accounting for packaging papers and 170,000 tons per year for board. This investment is made by the Varel paper and board mill to increase its total capacities to more than 650,000 tons/year and to meet their customers' particular demands even better in the future.

The paper machine has a wire width of 6,250 mm and will produce papers within the basis-weight range of 70-120 (150) g/m^2. The design speed of the machine is 1,300 m/min. It is laid out for a gross production capacity of 850 metric tons/per day.

From the headbox to the winder, all components will be supplied by Voith and are integrated in the **One Platform Concept**.

For this machine, Voith will equip the forming section with a **DuoFormer Base**, including a two-layer **MasterJet** headbox and a **ModuleJet** dilution-water control system for the back layer. In combination with the gap-former technology used, optimum CD profiles and strength properties will thus be achieved, while ensuring an economical use of raw materials.

The use of the **DuoCentri NipcoFlex** shoe press ensures excellent runnability and high dryness.

In the **CombiDuoRun** dryer section, the first three dryer groups are single-tier, while the remaining pre-dryer section is of two-tier design. The after-dryer section consists of two single-tier dryer groups and one two-tier dryer group. In addition to other Voith components, **Fibron systems** and **DuoStabilizers** will also be used in the dryer section.

A SpeedSizer application unit ensures uniform and trouble-free film application.

The **MasterReel** with linear-load measurement ensures optimum parent roll build-up with best winding quality. At the end of the process, a **VariFlex M** winder is also part of the advanced process technology.

Both partners agreed that the complete erection and start-up supervision as well as the project engineering for the paper machine will be carried out by Voith.

In addition to the technological competence and the convincing concept of Voith, the long-standing partnership based on trust between the Varel paper and board mill and Voith was another reason for placing the order with Voith. Apart from other rebuilds, Voith had supplied the worldwide first tandem NipcoFlex press for the production of board to Varel.

Fig.: *Varel paper and board mill, Germany.*

Emin Leydier, France – new production line for testliner and corrugating medium

In early May 2003, French paper manufacturer Emin Leydier placed an order with Voith for the delivery of the new production line PM 1 for testliner and corrugating medium. The large-scale project concerns to a greenfield mill, which will be built at Nogent-sur-Seine, France.

Fig. 1: *Les Papeteries Emin Leydier in Champblain/ Laveyron (Drôme), France.*

Fig. 2: *From left to right: Rudolf Estermann, Thomas Volkinsfeld, Voith Paper, Hugues Leydier, General manager of Les Papeteries Emin Leydier, Philippe Leydier, Chairman of Emin Leydier Group, Jean-Louis Leydier, project manager of the new plant.*

The family owned company Emin Leydier was founded in 1975. The company's headquarters are now located in Lyon, France. Currently nearly 500,000 tons of paper for corrugated materials based on recycled fibers are produced annually. Emin Leydier is a company especially committed to the environment. Choosing the advanced Voith process technology proves that this technology manages to combine the crucial quality parameters and productivity features with the highest environmental standards.

Emin Leydier also produces corrugated packaging in four plants in France and one in Italy (170,000 tons per year of corrugated board). Moreover, the company is investing in a new plan – elytra – in the west of France, which will produce food contact packaging.

The process

The PM 1, having a wire width of 6,050 mm, will produce top-quality testliner and corrugating medium in a basis weight range of 70-110 g/m^2. Its design speed will be 1,500 m/min. With an output of up to 1,000 tons/day, Emin Leydier will extend its position as one of Europe's leading packaging paper manufacturers.

Emin Leydier ordered the entire process technology from Voith, which underscores the particular process competences of the supplier. The production line has been well defined according to the successful One Platform Concept, from the stock preparation system to the finishing equipment.

The complete package contract for the fiber processing line, which will handle 100 % recovered paper, focuses on the best possible stock cleanliness and development of the furnish strength potential to satisfy the high quality demands of the final product.

Voith's Wet End Process, linking the stock preparation with the paper machine, provides a number of significant advantages for the papermaker, including optimum stock homogeneity, pulsation minimization and a more than 50% reduction in system volume. The result is enhanced sheet profiling.

The paper machine is designed according to Voith's latest technology. This advanced design combined with the extensive experience with secondary fiber treatment and high speed packaging paper machines will allow an optimized production process in terms of quality of the end product and economic efficiency of the production line.

Voith Paper Automation supplies an extensive package. In addition, Voith will be responsible for the supervision of installation and start-up and for the basic engineering. Special focus is put on several training phases for operating and maintenance personnel to ensure a smooth start up.

A Variflex M winder is used to slit all parent rolls coming from the PM 1 into finished rolls. To be able to handle the PM 1 production, winder is designed for an operating speed of 2,500 m/min and fully automated – flying splice unwind, fully automatic slitter positioning system, automatic finished roll change system, etc. For reasons of noise protection and safety, the VariFlex is of completely enclosed design.

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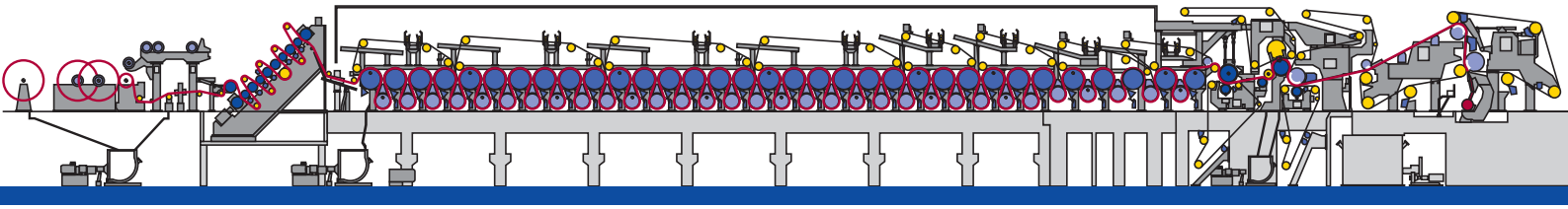
Fifth SC line ordered from Voith – Maxau PM 6

At the end of March 2003, Voith Paper received the order from Stora Enso Maxau GmbH & Co. KG, Germany, for rebuilding and modernizing the PM 6 at Maxau.



This is the fifth SC paper production line to be ordered since 1998 in Europe and America – all of which from Voith. The total capacity of all these installations is 1,160,000 t.p.a.

As already in Ettringen, Schongau, Donnacona and Laakirchen, Voith received the Maxau order against very stiff competition. Stora Enso's confidence in our trend-setting SC production technology once again confirmed Voith's market leadership in this sector.

This almost complete new production line replaces the 35 year old Voith PM 6 in the same building with an output of 140,000 t.p.a. The new PM is designed for a production capacity of 260,000 t.p.a. and will improve the customer's competitive standing thanks to higher productivity. Plant expansion plans envisage increasing the output of this line even further to 280,000 t.p.a. The furnish used will mainly be deinked pulp and bleached groundwood.

Based on the One Platform Concept, the new PM 6 was designed in close teamwork with Stora Enso to meet future market demands. This 8,100 mm wide paper machine will produce SC-B grades in the basis weight range 45-56 g/m^2 at a design speed of 2,000 m/min.

The new PM 6 line mainly comprise a **DuoFormer TQv**, a vertical former with excellent formation performance and **ModuleJet** headbox with dilution water control, the most widely used headbox in the paper industry, a **DuoCentri-Nipco-Flex** press section with separate fourth press for highest dry content and best paper quality with minimal 2-sidedness, and the advanced **TopDuoRun** drying technology.

Another highlight is the **Janus MK 2** online calender which with its divided stack of 2x5 rolls, including cooling rolls, gives optimal results with less blackening and greater flexibility. The **Sirius** reel system ensures minimal paper losses and highest wound paper roll quality, and, by upgrading the existing **VariTop** slitter, it will be possible in future to meet modern printing machine needs for large paper rolls up to 4,300 mm diameter.

The scope of delivery also includes new approach flow section equipment, complete engineering, complete erection, automation and overall process responsibility.

A system partnership for two years has also been agreed between Stora Enso and Voith. During this time new goals, going well beyond the contractual targets, will be set for productivity, paper quality and product adaptation.

After a very short "paper to paper" shutdown time of only 65 days, commissioning of the rebuilt PM 6 is planned for September 2004.

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Rauma PM 1 –
rebuild for high speed PM

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UPM Kymmene is one of the leading producers of magazine papers and produces on 25 paper machines in 7 countries worldwide. At the Rauma location, UPM Kymmene operates at present 4 paper machines; 2 machines each for SC papers and for LWC papers. With 1,200 employees and a production capacity of 1,160,000 metric tons per year, the Rauma paper mill is now the worldwide largest production location for magazine papers. Newsprint and coated/uncoated fine papers are produced in other divisions. Magazine papers are used for magazines, catalogs and advertising brochures. There is an increasing demand worldwide in this sector.

Yngve Lindström

Director LWC Production Unit UPM Kymmene

"The professional and innovative handling shown by Voith for the Rauma 100 project was very impressive to us. We are very satisfied with the progress of the entire project and the excellent restarting of the machine. The cooperation with Voith and the support which we were given during the project and are still given are excellent. We are very confident that we will reach the rebuild objectives within a very short period and that we might even surpass them in some areas."

Rauma is located in the South West of Finland directly at the Baltic Sea. Rauma is known for 3 things: its nice old town center, the production of lace and its special dialect. The old town center is one of the 4 places in Finland selected by the UNESCO as world cultural heritage. Today the town, founded in 1442 and with a population of 38,000, is characterized by industry, above all in the field of pulp and paper production.

Objectives of the rebuild

Wood-containing, coated papers for offset and rotogravure printing in the basis-weight range from 57 to 80 g/m^2 are produced on PM 1. The trim width of the machine is 8,150 mm.

PM 1 was originally started up in the eighties and rebuilt at the end of the nineties in the online coater and wet-end sections. The new rebuild should further improve the runnability and productivity of the machine.

After the evaluation of intensive technical and technological studies, Voith was selected as the supplier of the paper-machine rebuild. Considering the existing machine configuration and the targeted production speed, Voith definitely favored a rebuild of the third press into a Duo-Centri NipcoFlex shoe press and the replacement of the fourth press with dryers.

The design of the press concept was the main reason that it took the customer longer than expected to decide on the rebuild and on the supplier. Technological and commercial aspects had to be weighed up carefully. The rebuild concept was supposed to be state of the art, the rebuild time should be as short as possible and the paper machine should be restarted as smoothly as possible. Proper referencesproved that the solution suggested by Voith would meet the customer's expectations in every respect.

It is now state of the art to place the NipcoFlex press ahead of the open draw, to equip the dryer section with ProRelease boxes and DuoStabilizers and to operate the entire dryer section without ropes. UPM Kymmene Rauma wanted to reach, above all, an increase in production speed at constant efficiency as well as a reduction in the use of pulp. This was achieved by the higher dryness after the press and the resulting higher strength of the wet paper.

The project

The rebuild suggested by Voith will improve the runnability and efficiency of the machine and will also have a positive effect on the process in the paper machine. Results from trials with comparable pro-

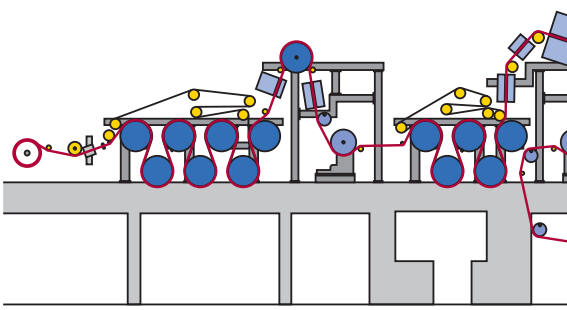
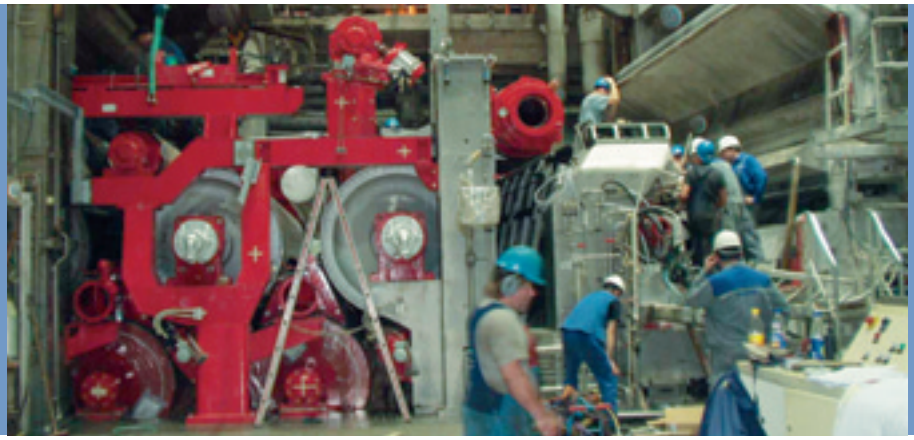


Fig. 1: *Rauma PM 1.*

Fig. 2: *At the rebuild.*

Fig. 3: *Kari Piipponen and Yngve Lindström.*

Fig. 4: *Scheme of PM 1.*



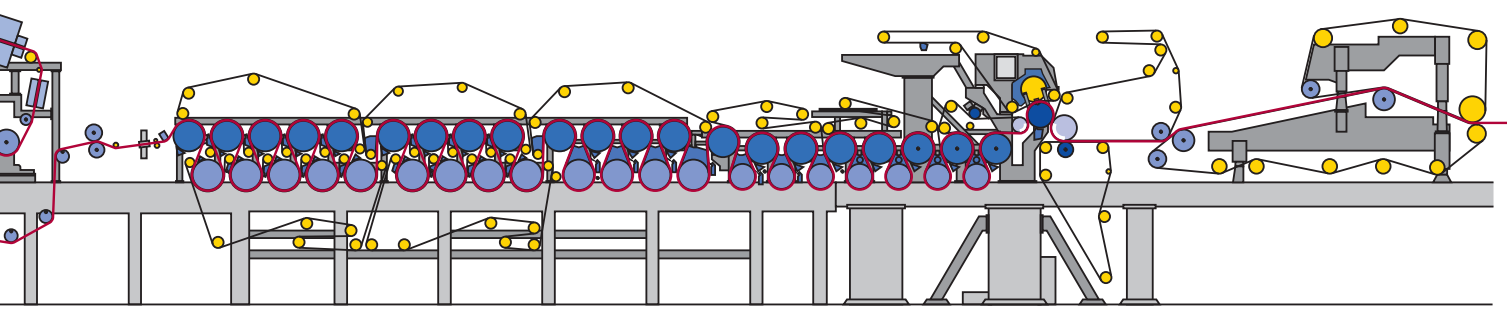
duction lines – with and without a fourth press – have helped to substantiate this concept. It is important to produce the end product – coated, wood-containing papers – at improved quality in future.

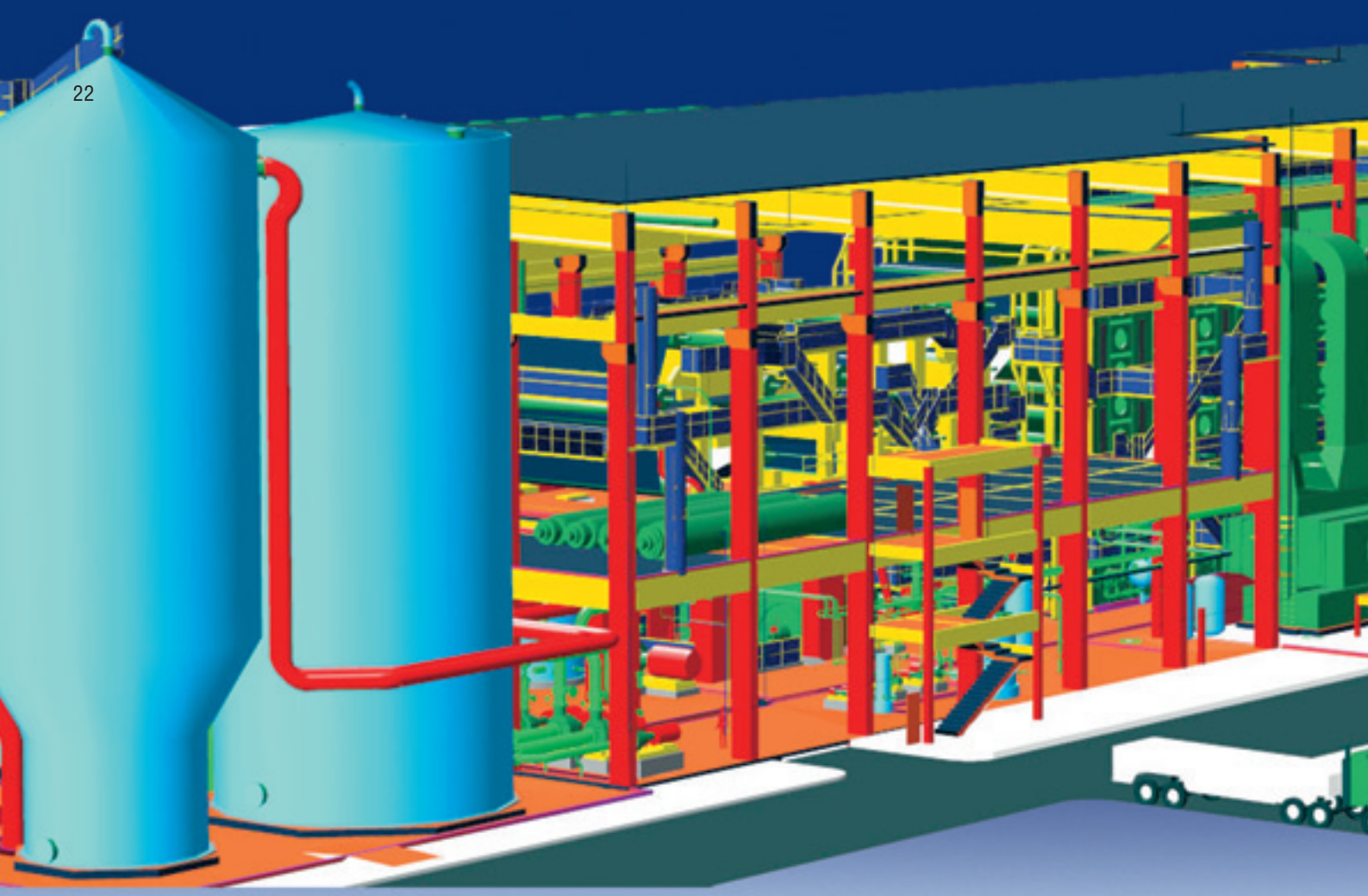
The entire rebuild is based on known and proven components and a concept, similar to what was installed in other recent rebuilds.The time between order placement and installation was extremely short. Already prior to the order placement, the future project team was selected and familiarized with certain partial areas. This guaranteed the short delivery time for the entire rebuild.

The cooperation with the customer was objective-oriented and based on partnership relations. Voith's experience with similar rebuilds and the customer's assistance for certain work made the smooth completion of the rebuild possible. Detailed planning was required in order to coordinate all activities to be performed during the short shutdown of 21 days from paper to paper and to ensure the timely restarting. Voith completed this phase two days earlier than planned. Already 10 months after order placement, the first parts were supplied for pre-assembly and after only 12 months, the machine was restarted.

In a first statement, the project work and the performance during erection and start-up were highly praised. The Rauma team was already familiar with the operation of the machine after a few weeks so that normal operation of the machine was possible very soon after the rebuild.

Today it can be stated that the main rebuild objectives were already reached a few weeks after the start of the machine. The goals set by the customer in the start-up curve concerning production and efficiency have already been exceeded. Voith will continue to cooperate with the customer in optimizing the paper machine to reach the ambitious goals.





Aracruz Celulose
inaugurates Fabrica C and starts to produce 2 million tonnes of pulp per year

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Aracruz Celulose, Brazil, world leader in the production of bleached pulp from eucalyptus, inaugurated its third operating unit, Fabrica C, on August 2nd, 2002. This unit will increase pulp production from 1.3 million to 2 million air dry metric tons per year.

The Fabrica C inauguration took place in the city of Aracruz, State of Espírito Santo, Brazil. Among the several authorities that attended the event, were: His Excellency Mr. Fernando Henrique Cardoso, President of the Federative Republic of Brazil; Mr. Erling Lorentzen, President of Aracruz Board of Directors and one of the main company shareholders; Mr. Antônio Ermírio de Moraes, shareholder of the Aracruz Celulose company and member of the VCP Group board (one of the major paper maker groups in the country); Mr. Carlos Aguiar, CEO-Aracruz; Mr. José Ignácio Ferreira, Governor of the State of Espírito Santo, and other authorities.

During the inauguration speech, Mr. Fernando Henrique Cardoso stated: *"What impresses me more is the imagination, the ingeniousness, the human capacity of inventing machines and mills of such magnitude. Before their construction, everything has to be planned. And afterwards, persistency is necessary to make the plan come true. We, in Brazil, need*

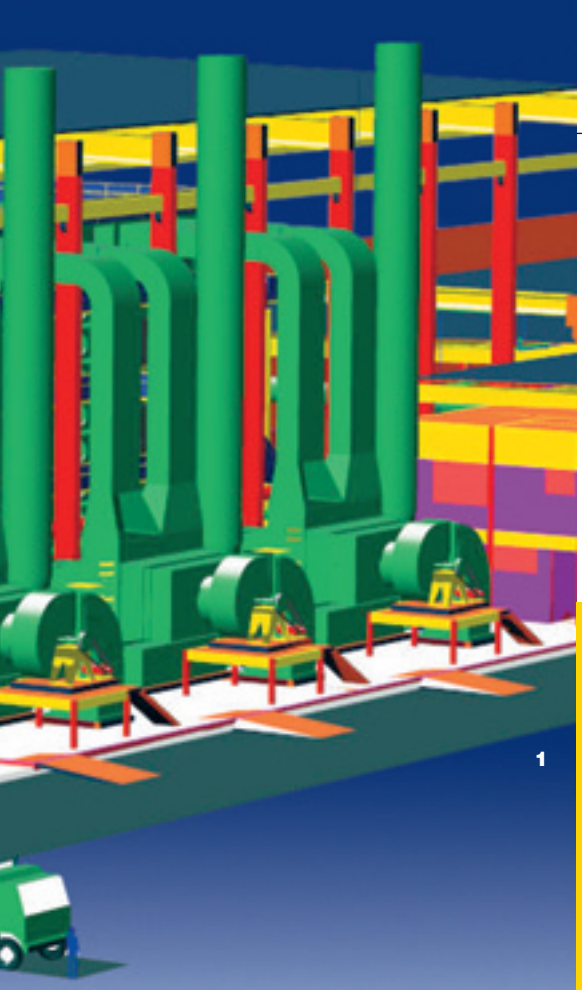

Fig. 1: *3D model.*

Fig. 2: *Drying and baling line general view.*

people like those who are implementing this factory, like the workers and technicians who work here, in this and in many other factories. We need people who can put together belief and undertaking capacity, who have working discipline, who advance within a program."

During the event, Mr. Lorentzen, President of Aracruz board of directors, recalled that, about thirty years after the Aracruz inauguration, Brazil is now leading with the world's largest pulp mill. *"The development provided by companies like Aracruz takes place in the inland areas, with great environmental and social benefits"*, he commented.

According to Mr. Carlos Aguiar, Aracruz CEO, the investment in this Aracruz expansion was the highest made by the Brazilian industrial sector in recent years. *"The pulp sector is essentially an exporter, a strong generator of foreign exchange to the country, with a positive net balance of major relevance in the present days of our economy"*, he stated. With the inauguration of Fabrica C, Aracruz will contribute with more than US$ one billion per year to the Brazilian trade balance, becoming the fifth major generator of net foreign exchange from exports in the Brazilian industrial sector.

The Project

The Fábrica C project involved the construction of a new manufacturing unit (the third one) with a production capacity of 700,000 tons of pulp per year, using the existent infrastructure. As a result, Aracruz capacity will be increased to 2 million tons of pulp per year.

The investment in the project was approximately US$ 800 million (US$ 555 million in the industrial area, US$ 220 million in the forestal area and US$ 30 million in logistics and social infrastructure), which, at the time of its realization, represented the highest investment made in the country by the private industrial sector.

Fábrica C generates of about US$ 350 million additional foreign exchange from exports, increasing Aracruz exports to US$ 1 billion.

Erection of the drying and baling facilities

The erection, completed on April 18th, was the start of the worldwide largest integrated line for the production of eucalyptus pulp, with 2,325 t/day estimated rated capacity. However, the pulp dewatering machine has already produced 2,444 t/day (production on August 25th, 2002 – 122 days after the machine start-up).

Very motivating right from the start, this project was a great achievement and a superb challenge.

Considering that good planning is essential for any successful action, Voith has accompanied the whole project step-by-step, right from the start of the work. With this support to the civil portion of the work, eventual surprises that could delay the delivery schedule were prevented.

Renato Guéron

Director of Engineering and Projects of Aracruz Celulose

"The drying machine and the three baling lines were the installations supplied by the Voith-Andritz-ABB-Moura Schwark Consortium, in the complete package modality (EPC), for our newly inaugurated Fabrica C.

Many excellence aspects were demonstrated to us, starting from the conceptual projects, the after-sales service, the equipment, very-well developed logistics with equipment coming from Brazil, Austria and Germany, very-well managed construction and erection works, first quality training and commissioning and, finally, a start-up strictly within schedule and very successful. What also impressed us very positively were the proactive attitudes and the clear communication during the whole project, as well as the efficient ways applied to keep the schedules and to solve problems.

Now, after 5 months of operation, we can confirm that we made the right choice."

The Consortium – four suppliers in synergy: Voith Paper, Andritz, ABB, Moura Schwark

Aracruz, the leading eucalyptus pulp producer in the world, already operating with 4 Voith machines, has shown trust in the competence of our company by contracting the named consortium. Voith had the main responsibility from the planning phase to start-up.

Despite the great challenge, the companies involved accepted the proposal and, within an exceptional time schedule of 18 months, completed the ambitious Aracruz Fabrica C Project. Throughout the whole project, and in conjunction with a team of competent professionals, the consortium filled very successfully the order placed by Aracruz for the supply of the Drying and Baling Line for its new unit, inaugurated on August 2nd, 2002, in Espírito Santo.

The whole technology for the Drying and Baling Machine is innovative. In addition to its double wire and a more compact design, its production capacity is twice that of the two lines (3 and 4) now in operation in the Aracruz Mill B.

The choice of the right partners was decisive to enable Voith Paper to reach the expected result. Voith Paper was responsible for the supply of the presses, the cleaning system, the mechanical erection and the detail mechanical engineering. ABB supplied the Flakt dryer; Andritz, the Twin Wire Former – TWF, as well as the cutter, the baling line, the basic engineering, the detail electric engineering and the electric installation. Moura Schwark was responsibility for all construction work.

At the end of the project, Aracruz invited all on the project involved personnel to a celebration dinner and, in this ceremony, paid tribute to the companies for outstanding performance during the execution of the work, by delivering certificates and placing an advertisement in the media. The Voith-Andritz-Moura Schwark-ABB consortium was distinguished with the "Proactive Partner" category award.

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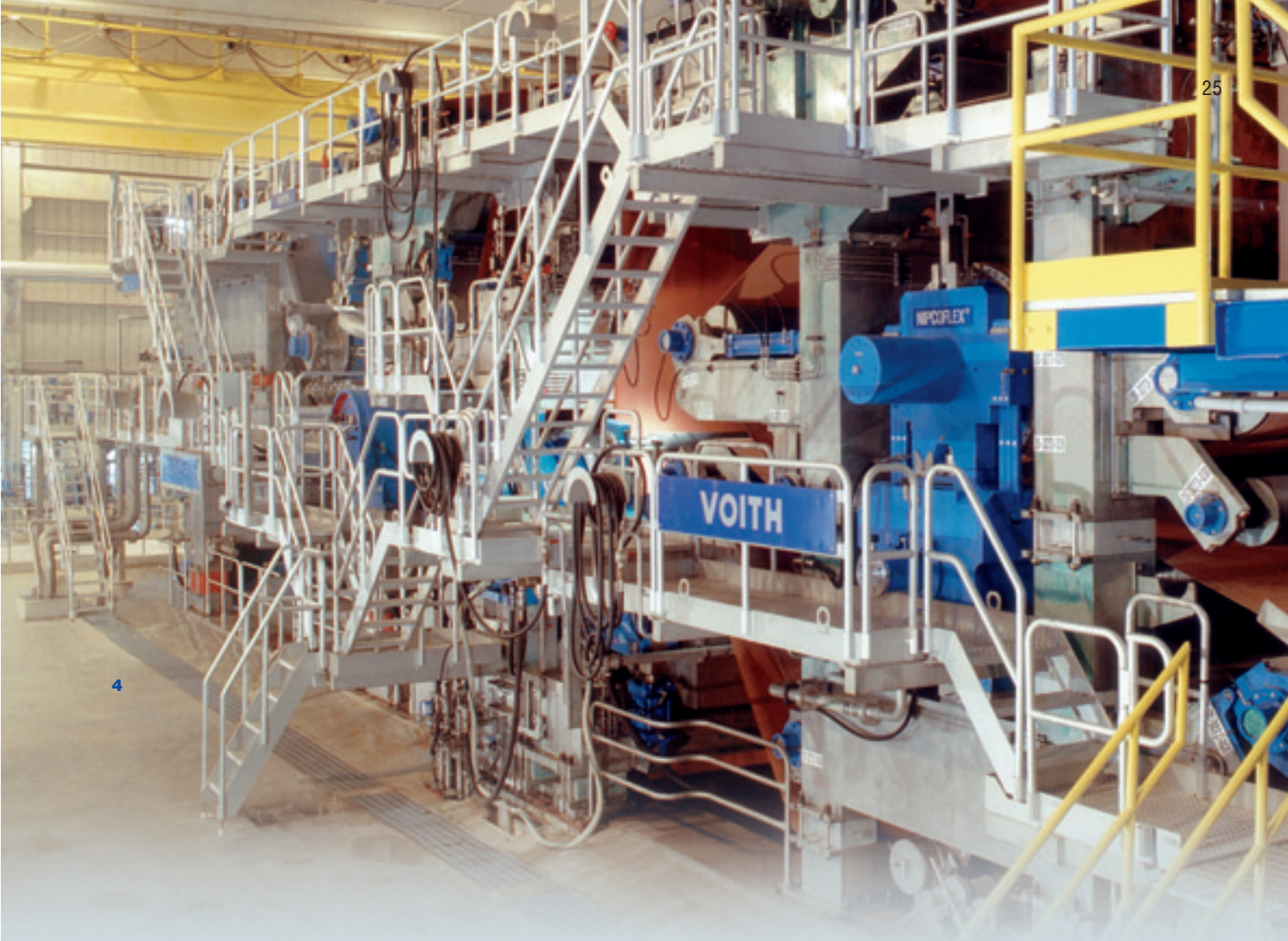

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Fig. 3: *Screening system.*

Fig. 4: *Wet end.*

Fig. 5: *Baling line.*

The Start-up

Thanks to the pre-planning of activities, commissioning and start-up process proceeded within the usual parameters of an installation of this magnitude. The synergy among the technicians of the companies involved and Aracruz itself was noticeable from the very beginning.

5

The machine, started-up on August 2nd, 2002, has already exceeded the production parameters, for which it was designed, together with the quality parameters demanded by the customer.

The start-up process of the "Aracruz Fabrica C" project made use of an additional tool, that surely contributed to accelerate the machine start-up curve. Aracruz implemented a total process simulator – which is as important for the pulp industry as the flight simulator is for the aeronautic industry.

This simulator is an advanced resource that allows to check the precision of the automation and control systems, analyzing early on eventual mistakes in the project engineering. An additional benefit is the training and qualification of operators for the system start-up.

A new commissioning management concept – successfully proven on Hürth PM 1, Germany

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Voith Paper's new commissioning management concept for large projects was first implemented with great success on Hürth PM 1. The new concept is explained here together with its goal set and how the goal set was reached, the three phases of commissioning management, and results in detail.

The Hürth PM 1 production line at Rhein Papier, a Myllykoski Group member, is a greenfield plant near Cologne in Germany.

This newsprint line, using 100% recovered paper furnish, is designed for a maximum operating speed of 2,000 m/min and a trimmed paper width at the reel of 8,160 mm. Maximum annual production is 280,000 tons. The Voith scope of supply – stock preparation line, paper machine and automation system – is described in a separate reprint.

What does commissioning entail?

Commissioning activities generally begin hand in hand with the final erection work.

To assure the customer a thoroughly tested paper machine ready to go on line without delay, the subsequent phase requires close teamwork between commissioning specialists in the areas of process technology, machine control systems and programming.

Commissioning management: goals and how they are reached

The primary goal is to ensure a thoroughly tested paper machine ready to go on line without delay and without problems. In extreme cases, hasty and careless commissioning can lead to damage and even injury during production start-up. To ensure optimal efficiency and eliminate such risks, each Voith commissioning engineer receives a clear briefing, with adequate task preparation time in Heidenheim. Furthermore, a detailed checklist is compiled in advance so that all on-site commissioning activities are always under control down to the last detail.

After completing hydraulic system flushing procedures, Hürth paper machine 1 was commissioned in 3.5 weeks to stock-on-wire, in full compliance with the tight budget for personnel costs. Although commissioning time could have been even shorter, this would have required an increase in site personnel. Time-critical aspects of the Hürth commissioning project included certain parts of the paper machine controlled by one and the same central processing unit (CPU) – for example, the TQv former and tandem NipcoFlex press. The tandem NipcoFlex press was therefore commissioned during the dayshift, and the former during the nightshift. This required an additional commissioning team for the nightshift, that included specialists in process technology, machine control systems and programming.

Fast commissioning demands strict discipline among all concerned, and team player commitment is essential. This is the only way to ensure the efficient communication, both internally and with the customer, that is so important for success.

Another important element of Voith's new commissioning management concept is **"lean commissioning"**. On the just-in-time principle, commissioning personnel are not called to site until everything is ready for them to do their jobs. This eliminates unnecessary waiting time, which not only escalates personnel costs but also has a negative effect on morale.

A key aspect of the **"lean commissioning"** concept is a well-defined team structure. All responsibilities, both internally and toward the customer, are defined clearly and unambiguously. The chief commissioning engineer is in charge of site activities and personnel throughout the commissioning phase. Separate commissioning engineers allocated to each main section of the paper machine are responsible for coordinating activities in that area. This is the only way to ensure efficient and professional working during hectic phases.

Successful commissioning also depends on profound trust between the customer and the Voith team. Both sides have to contribute to this, mainly by upholding clear and transparent communications during commissioning. In the present case commissioning meetings were held every two days between Rhein Papier and Voith, and an optimization listing for PM 1 was jointly maintained by the two partners.




The three phases of Voith commissioning management

Voith's commissioning management concept for large projects is divided into the following three phases:

Phase 1

Preparation for commissioning prior to on-site activities.

Main tasks:

- Compilation of a commissioning schedule defining all intermediate targets (time planning)
- Definition and fulfilment of man power requirements (capacity planning)
- Internal Voith commissioning kick-off meeting, followed by at least one commissioning meeting with the customer prior to on-site activities
- Customer personnel training preparation and support.

Phase 2

Thorough dry-testing of all paper machine functions.

Phase 3

First paper at the reel, 24-hour production start-up, and initial technological optimization of the PM.

A closer look at first-phase activities underlines the importance of this planning stage. As overall plant supplier, Voith insists on thorough project planning prior to on-site activities.

The main sections – stock preparation line and paper machine – are first integrated into the commissioning network plan. Without fail, the "stock on wire" and "stock preparation line operational" deadlines must be synchronized. Ideally, the critical time path should include a reserve of about 4 days: excessive reserve wastes human resources due to waiting time.

After setting these two key milestones, the schedule can be broken down according to start of erection and start of commissioning for the stock preparation line and the paper machine. Before commissioning can begin, the following conditions must be fulfilled:

- All machinery erection work completed
- All electrical installations completed
- All hydraulic and pneumatic pipe work completed, blown out and flushed (hydraulics)
- I/O checks completed
- Power available to operation station (OS), automation station (AS), and engineering station (ES)
- Power available to motor control centre (MCC); rotational direction checks completed in test mode
- Availability of steam, water, compressed air and instrument air.

Particularly important in the second phase are efficient communications and a solid trust basis between the customer and Voith, together with the lean commissioning concept.

The third phase of commissioning management began with a start-up meeting between Rhein Papier and Voith, where a schedule was jointly established to ensure dependable target attainment. The goal for the first start-up day was stable operation of the former and the approach




flow section. On the following day, paper was run through the press section.

On July 4, 2002 (start-up day 3), a new world record for start-up speed was set with first paper at the reel at 1,560 m/min. Continuous 24-hour production started only two days later on July 6, 2002. Voith specialists remained on site day and night for two weeks to monitor production, carry out optimization, and support the customer's operating personnel with intensive on-the-job training. As another important commissioning task, they also ensured professional site status reporting and maintained an optimization listing together with the customer.

A speed-up trial on PM 1 was scheduled by Voith commissioning team and the Rhein Papier production team for August 6, 2002. On that day the newsprint machine operating speed was increased from 1,560 to 1,912 m/min – an impressive demonstration of this new line's capacity potential.

Summary

There were three key reasons for the success of Hürth PM 1 commissioning:
1. Ongoing excellence of the Voith One Platform Concept for paper machines.
2. Partnership between customer and supplier right through the project and commissioning phases. This outstanding teamwork between Rhein Papier/Myllykoski and Voith is also reflected in the short time of only 486 days from placing order (March 5, 2001) to first paper at the reel (July 4, 2002).
3. Professional project management, erection and commissioning management by Voith Paper, both with regard to project planning and site activities.

We pay tribute here to all Rhein Papier and Voith colleagues involved in this commissioning, and to all the respective subcontractors.

The commissioning impressions depicted above give some idea of how people both on the side of the customer and the supplies, contributed to this common success.

Highlights of the Hürth PM 1 commissioning from July to November 2002:

July 4, 2002
First paper at the reel at world record startup speed of 1,560 m/min.

July 16, 2002
Rhein Papier confirmes Voith contract, that PM 1 produced saleable paper and DIP in continuous operation.

July 19, 2002
PM 1 gross production for the first time exceeded 600 t/24 h paper at the reel (602 t/24 h).

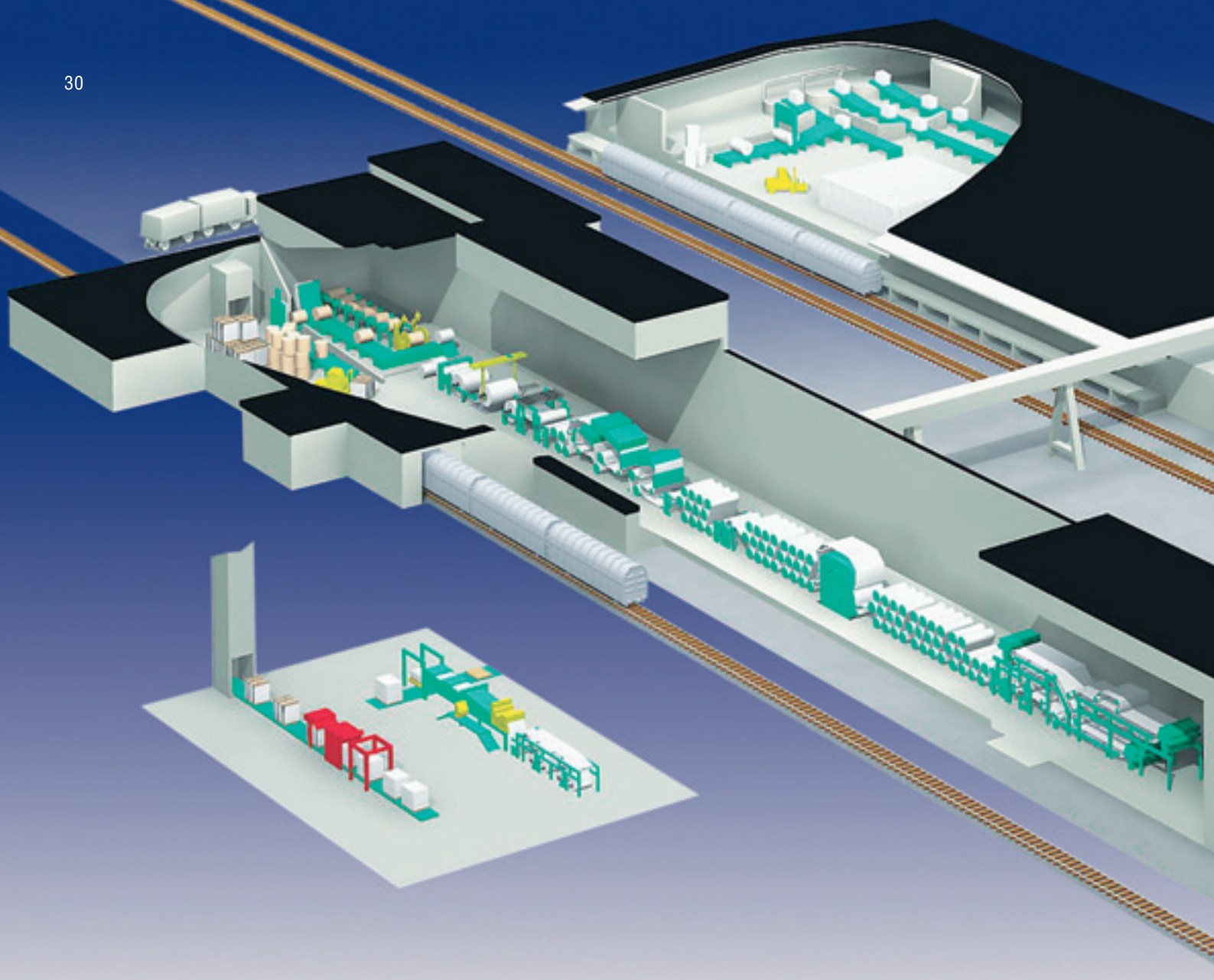
August 3, 2002
PM 1 gross production for the first time exceeded 800 t/24 h paper at the reel (809 t/24 h).

August 6, 2002
PM 1 speed-up trial
PM speed increased from 1,560 to 1,912 m/min paper at the reel.

August 2002
Excellent printing results at Axel Springer Printers, Kettwig.
Axel Springer Publishers confirmed order for PM 1 paper.

August 2002
PM1 actual average paper production, finished and wrapped: 546 t/day.
Target production according to scheduled start-up curve: 322 t/day.

November 2002
Continuous operation at 1,740 m/min.



Äänekoski BM 1 rebuild –
a particular reference in Finland

Franz Fischer

Paper Machines
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M-real Oyj's Äänekoski board and paper mills are located about three hours by car from Helsinki and only 40 kilometres from the parent company of an important competitor of Voith. With an annual output of more than 600,000 tons, M-real is the second largest producer of folding boxboard in Western Europe. After extensive preparations, Äänekoski decided to establish a new product in the market and to rebuild the existing BM 1. Voith has been chosen as a reliable partner for the ambitious upgrading of the board machine and the coating section.

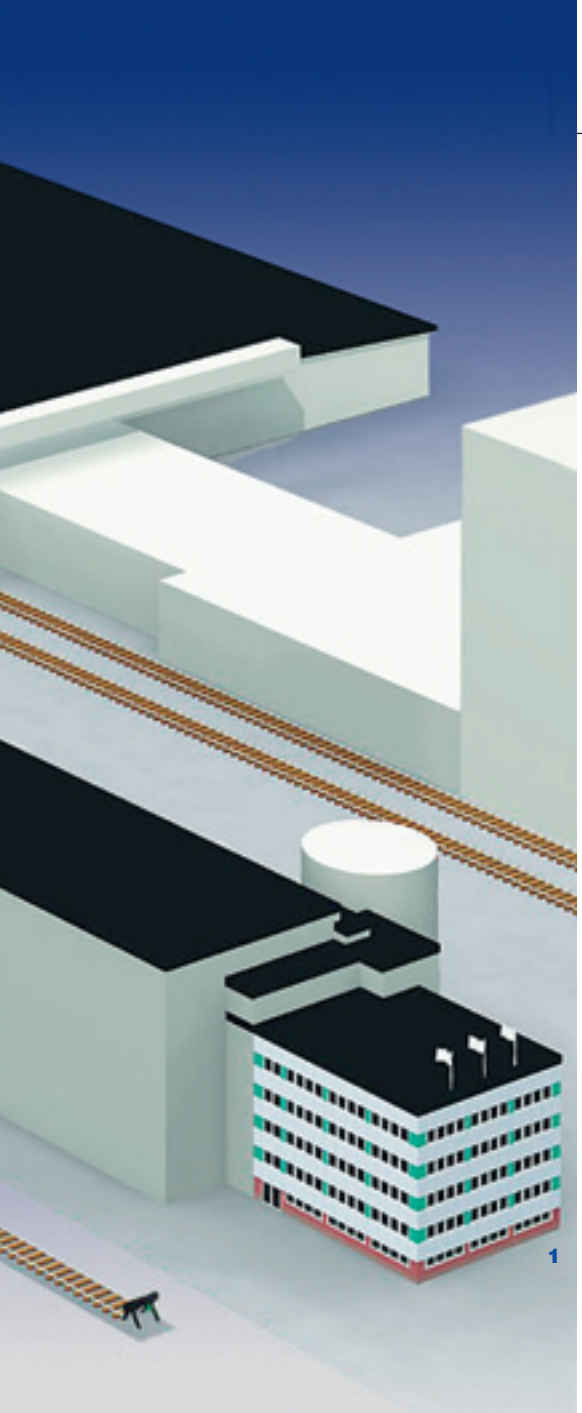

Fig. 1: *M-real Oyj, plant Äänekoski.*

Fig. 2: *M-real and Voith teams signing the contract.*

Fig. 3: *Civil works during the rebuild.*

Äänekoski board machine 1 was started in 1966. In the 70s, wallpaper base passed folding box board as main product. In the 80s, BM 1 was modernized to a flexible swing machine for wallpaper base and folding boxboard. In 2002, M-real concentrated wallpaper base production at Kyröskoski mill and Äänekoski BM 1 was rebuilt to produce exclusively high-quality board grades for packaging and graphic end-uses. After the new extensive rebuild, the Äänekoski mill, with 200 employees, will produce 160,000 tons/year of top-quality virgin fiber board.

Targets of the project

The project was aimed at producing a board grade that comes up to the standard of solid bleached board (solid bleached sulfate, SBS) in terms of brightness and of folding boxboard (FBB) in terms of stiffness. In other words, the best properties of SBS and FBB were combined by using high brightness BCTMP in the middle layer of the board. BCTMP is supplied by the M-real Joutseno BCTMP mill.

Further strategic goals were to boost the annual production from 115,000 tons to 160,000 tons and to exclusively produce the new board grades (Carta Solida and Carta Integra) on BM 1. The production of wall paper base was moved to the Kyröskoski mill, Finland.

Project phase

The partners agreed that the project development phase had been excellent. M-real Äänekoski had prepared the project optimally, and Voith was able to start work immediately after the 1st project meeting in Äänekoski on September 17, 2000. Jointly with the customer, they worked out a completely new layout for the BM 1.

The rebuild included an upgrade of the hybrid former, an entirely new press section, a new three-tier dryer section, new heating and ventilating equipment, a new Yankee dryer, a steam-heated hood, a SpeedFlow, and three new JetFlow F coating units.

Reference visits to other Voith customers were organized in February and March 2001. In addition, a number of tests were performed on the pilot paper machine in Ravensburg, Germany, in cooperation with the Äänekoski project team. After a project development phase of only eight months and merely 10 project meetings, M-real placed the order with Voith on May 7, 2001, which was the biggest order from Finland up to then.

4

Fig. 4: *The new NipcoFlex press.*

Fig. 5: *Coating section.*

5

Main data of BM 1 after rebuild

Capacity	160,000 t/year
Basis weight	170 - 335 g/m^2
Max. operating speed	660 m/min
Design speed	800 m/min
Trimmed width	3,620 mm
Machine length	140 m

The technology

Wire section

To ensure optimum and reproducible formation, the forming box of the existing hybrid former was replaced with the proven DuoFormer D forming box.

Press section

Due to the high demands on product stiffness and the limited space conditions, a double-felted NipcoFlex press was installed in the 2nd press position. The NipcoFlex press ensures highest dry contents, thus enhancing not only the quality of the end product, but also the economic efficiency of the machine.

Dryer section

The dryer section rebuild was a great challenge due to the high capacity requirement and the small space available. A practicable solution was to install a three-tier dryer section. An optimum layout was worked out jointly with the customer, allowing fast roll and dryer fabric changes.

Yankee dryer

A Yankee dryer of 6.7 m diameter, weighing 170 tons, was installed to meet the high smoothness requirements. The Yankee dryer hood is steam-heated.

After-dryer section and SpeedFlow

The after-dryer section is of three-tier modular arrangement. The modular design offers the advantage of five identical dryer groups, reducing in particular the maintenance work.

The SpeedFlow size press was installed in order to meet the high stiffness requirements.

JetFlow F

The printability and the smoothness of the end product placed great demands on the technology used. To satisfy these product requirements, the existing roll applicators were replaced with JetFlow F free jet applicators. An essential advantage of the JetFlow F, as compared with a roll applicator, is that the coating color is applied without being pre-dewatered and needs not to be re-diluted in the coating color circuit.

In addition, the two existing two-roll calenders were relocated, and the secondary reel was upgraded.

Fig. 6: *SpeedFlow.*

Fig. 7: *Yankee dryer.*

Fig. 8: *JetFlow F.*

Fig. 9: *Delivery of the Yankee dryer.*

Fig. 10: *Reel.*

6

7

The rebuild

The last parent roll of board was produced on the old machine on July 18, 2002. Within four days, the complete BM 1 – except the wire section – was dismantled. Apart from huge construction work on the machine beam and foundation and the installation of new sole plates, the first parts for the press section were installed on July 28, 2002.

Exactly on schedule, the Yankee dryer of 6.7 m diameter and a weight of 170 tons was lifted by a 600 tons mobile crane through the roof into the hall on August 3, 2002.

Meanwhile, 56 old dryers and the reused equipment were refurbished in a workshop, 400 kilometres to the north of Äänekoski. What a great logistic challenge!

The tight schedule of only eight weeks of shutdown could be met due to perfect organization, and a board web was run as far as the press-section broke chest on September 7, 2002.

On September 16, 2002, at 00:57 hours, the first parent roll of saleable board was wound up on the reel.

On the next five days, the three JetFlow F coating units were put into operation, and the board grades Carta Integra and Carta Solida were produced within a few days.

8

In the meantime, the BM 1 has been further optimized and produces the top quality expected by M-real at the full satisfaction of their customers.

This rebuild was the biggest order Voith ever executed in Finland. Voith proved in an impressive way that they have both the technology and the process know-how to make extensive rebuilds of board and paper machines a success, thus helping the customer to be successful in the market.

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1

Successful rebuild of two board machines in Asia by Voith IHI

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Voith IHI Paper Technology Co., Ltd. in Tokyo, is a joint venture between Voith Paper and Ishikawajima-Harima Heavy Industries/Japan and was established two years ago. Voith IHI represents the full product line of Voith Paper. Recently, Voith IHI successfully started up two board machine rebuilds.

Koa Kogyo Co. Ltd. (Japan)

Koa Kogyo Co., Ltd., has 350 employees and an annual recycled board production capacity of approx. 500,000 tons in their mill near Mount Fuji. Six machines are presently operating at this location.

The rebuild

PM 6 originally started up in 1970 and was rebuilt successfully by Voith IHI in 2000 with a double-felted Flexonip shoe press in the third position. Quality improvements due to the shoe press were impressive and consequently, as a next step, the customer decided to further improve the product quality by rebuilding the entire wire section. The machine has

Fig. 1: *Koa Kogyo PM 6 – Wire section rebuild, started up on 2003.03.11.*

Fig. 2: *Koa Kogyo PM 6 – NipcoFlex rebuild done in 2000.*

2

a wire width of 4,320 mm and produces linerboard with a basis-weight between 160 and 280 g/m^2.

The existing wire section was designed for three layers, however, it was outdated from a technological point of view. Therefore, the PM 6 was rebuilt to a most modern multi-ply fourdrinier concept (four layers) to be able to produce high-quality linerboard more efficiently in the future. For this reason, three compact formers were installed for the top, under-top and middle layer. In addition, three new headboxes were installed at the same time for best formation.

All layers are produced from nearly 100% recycled furnish. For the top layer, white recycled furnish is used.

The main requirements for this rebuild, like the improvement of sheet formation and strength properties, were completely fulfilled. At the same time, CD basis weight profiles could be improved and the use of chemical additives could be reduced.

Startup

The delivery time for this rebuild was extremely short (8 months) and could only be met by very detailed scheduling and best team co-operation.

On February 15, 2003, the machine was shut down and partly disassembled. Excellent and constructive cooperation between Koa Kogyo and Voith IHI and all other partners involved made it possible to complete the rebuild shortly ahead of schedule, and to start production again on March 11, 2003. The machine produced saleable linerboard from the first parent roll and presently operates at a speed of approximately 600 m/min.

Kenji Ohkubo

Senior Manager Production Department, Koa Kogyo Co. Ltd.

"The team of Voith IHI Paper Technology and the staff of Koa Kogyo Co. Ltd. have done an excellent job. The goals of the rebuild were achieved and we appreciate in particular the improvement in formation, which enables to produce linerboard with:

- *a better surface*
- *improved strength values (by 10-20 %)*
- *significant reduction of additives used (additives were used for higher paper strength)*
- *a reduction in virgin pulp.*

The operation is very easy, and there are no problems like sheet-breaks in the wire section. We hope this project will be a long, mutually rewarding business association."

3

Korea Export Packaging Ind. Co. Ltd. (Republic of Korea)

Korea Export Packaging (KEP), with 280 employees and an annual capacity of approximately 220,000 tons, is one of the leading board producers in Korea.

KEP was founded 50 years ago with the challenging target to not only produce board grades, but to convert their own products in their own converting units. KEP has one board mill, the Osan Mill, which is located near Seoul, and three converting plants. Only 60 people are employed in the board mill.

The rebuild

In Spring 2001, shortly after the establishment of the new Voith IHI joint venture, KEP decided to modify their existing KM 1 in Osan Mill in order to increase production and to achieve higher quality.

The KM 1 with a wire width of 4,440 mm has a three layer wire section and produces mainly testliner in a basis weight range of 160 to 240 g/m^2 from approx. 85 % recycled furnish.

For the improvement of CD BW profiles, KEP decided to replace the headbox for the backlayer with a new MasterJet F/B headbox. The existing press section consisted of a suction press roll in the 1st nip and a long nip press in the 2nd nip and was also rebuilt. KEP decided to relocate the long nip press to the 1st nip position and to install a single felted Nipco-Flex shoe press into the second press position.

With all these modifications, dryness could be increased to approx. 48 % after the 2nd nip.

The rebuild by Voith IHI led to the expected quality improvement and the desired production increase.

Fig. 3: *KEP BM 1 – MasterJet headbox in operation.*

Fig. 4: *KEP BM 1 – NipcoFlex rebuild started up in November 2002.*

Fig. 5: *KEP BM 1 – Production increase after rebuild.*

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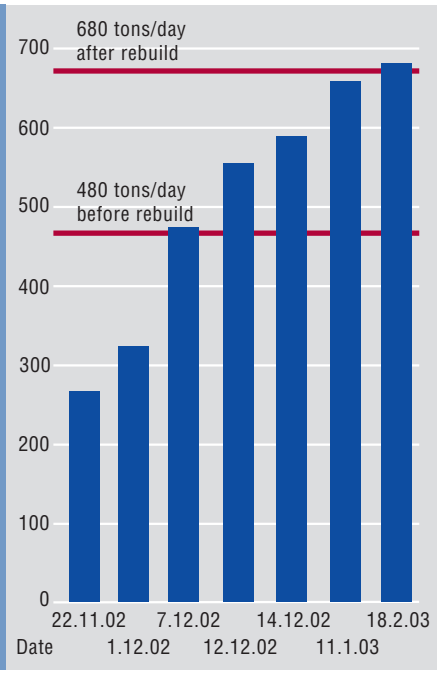

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S. J. Lee

Managing Director of Korea Export Packaging Ind. Co. Ltd.

J. S. Kim

Mill Manager of Korea Export Packaging Ind. Co. Ltd.

Startup completed in record time

As Osan BM 1 is the only production machine at KEP, it was essential for the customer to have a short shutdown period for the rebuild and to avoid any risk of delayed startup.

The shutdown was scheduled for one month. This period was very short, considering the extensive rebuild that included the complete press and other modifications, that were performed by local Korean subsuppliers.

The machine was stopped mid October and since all people involved exactly fulfilled the schedule, the machine was started up successfully again on November 19, 2002.

Here, too, we appreciate the good partnership between Voith IHI and KEP's project team, mill management and installation staff to carry out the rebuild as scheduled and to start commercial operations as expected.

It is remarkable that just one month after start up, the maximum NipcoFlex shoe press load of 1,200 kN was achieved. In addition, the maximum operating speed of 650 m/min was reached within two months after start up and the expected improvement of the paper quality was confirmed. The possibility to reduce the virgin pulp stock by 20 % is also very significant.

"BM 1 rebuild project was our first project with Voith IHI. All Voith IHI members have shown great teamwork capability from the very beginning of this project. We believe that we owe this success to their performance. Through this modification, we have achieved higher quality and an increase in machine speed, and we enjoy an even better reputation in the Korean market. We expect Voith IHI to maintain the good relationship and ask for their support for the further development of our company."

"Triple Day" in Düren

Presentation of the new three-layer inclined-wire technology

Dr. Klaus Afflerbach

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Under the motto "Triple Day", Voith Paper welcomed 49 experts from 23 companies, who are familiar with wet-lay nonwoven production. Guests from 10 countries could convince themselves of the innovative force and technical competence in the field of specialty paper machines in Düren.

Triple Day

The event for the presentation of the newly-developed HydroFormer M3 took place on April 3, 2003 during a customer conference in Düren. Mr. Endters, the managing director, welcomed the guests. This was followed by various technical presentations about inclined-wire technology. On this occasion, the new three-layer HydroFormer M3 was presented with 3-D animations.

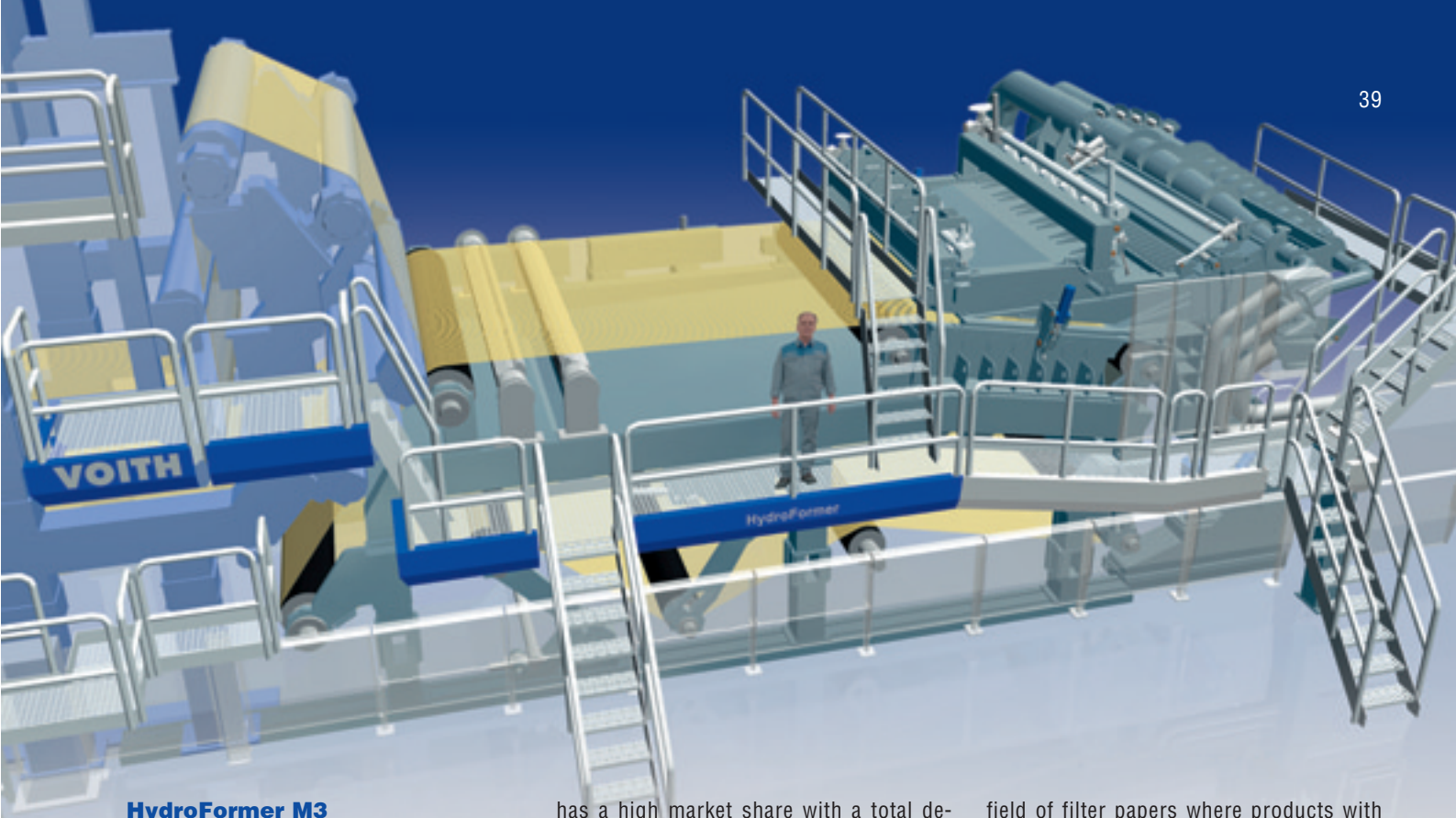
The technical presentations were rounded off by a guest contribution of a wet-lay nonwoven specialist. In his presentation, Gene Reardon from the USA compared existing multi-layer technologies in the field of wet-lay nonwoven production to the new development by Voith Paper and highlighted the advantages and flexibility of the new concept for future customers.

Between these presentations, the guests had the opportunity for extensively examining a pre-assembled HydroFormer M3 in the factory shops.

All pneumatic and hydraulic HydroFormer M3 movements were functioning so that, among other things, the headbox accessibility for maintenance, cleaning and wire change could be demonstrated.

The conference program was rounded off by the production of a three-layer product on the wet-lay nonwoven pilot unit. A number of guests took the opportunity to examine the produced three-layer product immediately with an expert's eye.

During an evening banquet, the guests had the opportunity for an intercultural, personal and specialist exchange of experience.



HydroFormer M3

The HydroFormer is a sheet forming unit on which wet-lay nonwovens and long-fibre papers can be produced. The headbox operates with stock consistencies of 0.01-0.1%. Due to these low stock consistencies, long-fibre papers with fibre lengths up to 32 mm can be produced with homogeneous formation.

Typical HydroFormer products are for example:

- glass fiber mats
- tea bag paper
- high-porosity plug wrap papers
- overlay papers
- filter papers.

In the past, Voith Paper produced single and double-layer HydroFormers. Voith has a high market share with a total delivery of 54 HydroFormers.

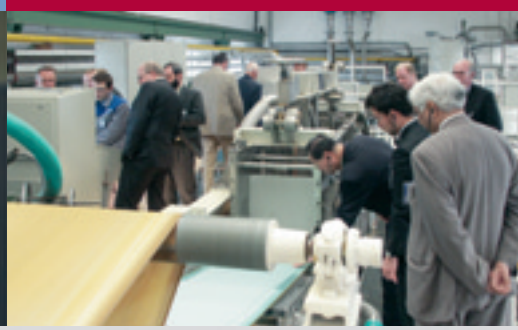
The development of the three-layer HydroFormer M3 was started in Düren two years ago. Interested customers were invited to get to know the new procedure after a test phase at the pilot unit.

The response to this was so high that – after successful tests – the first HydroFormer M3 for the production of three-layer specialty papers was ordered with Voith Paper in April 2002.

The start-up of the new paper machine with the first HydroFormer M3 is scheduled for August 2003.

The HydroFormer multi-layer technology allows the production of new wet-lay nonwoven products for example in the field of filter papers where products with new features can be created or in other fields, where fillers can be embedded between two plies.

The feedback from customers showed clearly that the relatively small group of wet-lay nonwoven producers had waited for new, innovative solutions.



Copamex – innovative NipcoFlex technology remains on the advance

1

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The new crescent former tissue machine with TissueFlex Technology, ordered at the end of the year 2000 with Voith Paper by Copamex, the second largest paper producer of Mexico, has successfully been started up. The machine was built by Voith Paper in Brazil and is dimensioned for a 2,000 m/min maximum design speed, with a wire width of 3,600 mm, for the production of tissue papers with basis weights between 13 and 36 g/m².

Copamex is one of the leading Mexican producers of kraft paper for multi-layer bags, bathroom tissue and paper towel as well as specialty papers. The company is one of the major producers of bleached pulp and secondary fibers for recycled paper for national and international markets.

The development of the TissueFlex Technology is based on the experience that Voith Paper accumulated as the market leader of NipcoFlex shoe presses. NipcoFlex presses are on the advance worldwide and are being used successfully in the production of almost all paper and cardboard grades.

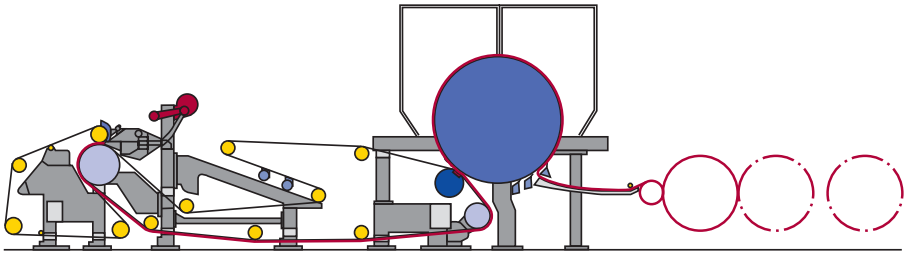
In TissueFlex technology, the tissue web is dewatered mechanically in the wide nip between the shoe press roll and the Yankee cylinder.

This innovative idea created a high interest worldwide with the tissue producers. Continuous improvements and optimizations of the new TissueFlex technology resulted in today's production of tissue of exceptional softness and higher bulk, important factors for sanitary and facial

Fig. 1: *The Crescentformer Tissue PM.*

Fig. 2: *Schematic of the Tissue PM.*

Fig. 3: *The start up team.*



papers. In addition, the water retention and absorption of the paper is increased, decisive quality characteristics for kitchen towels.

The positive experiences with commercial installations showed an increase in bulk of 10-20% and 5-8% fiber saving plus excellent softness. Thus, the expectations were fulfilled or even exceeded. All clients share the enthusiasm regarding the high-quality tissue paper produced with the TissueFlex.

Voith Paper led a consortium formed by Meri, a joint venture partner of Voith Paper and ABB for the supply of an extensive equipment package for Copamex. This included, in addition to the complete tissue machine, a stock preparation line, a high-efficiency hood for the Yankee cylinder, and the electric drive as well as automation and the quality control system.

The stock preparation for virgin fiber with a capacity of 67 bdmt/day bd consists of the pulping, cleaning and refining systems. For the approach flow system, the cleaning system and the fan pump were supplied as well. Fiber recovery from the machines white water circuit was done by the Meri installed DAF-type clarification system.

The crescent former guarantees easy operation and allows a higher flexibility for the production of top quality tissue.

The TissueFlex technology makes the production of high-quality tissue papers with increased bulk and softness possible and enables a reduction of fiber consumption or, alternatively, an increase in production capacity. There are now eight installations worldwide of this innovative technology, five of which are in the Americas.

A 4,572 mm diameter Yankee cylinder, internally grooved, manufactured by Voith Paper Brazil, together with a high-efficiency hood by ABB, form a unit that allows operating the machine at maximum speeds and production capacities.

The end section comprises a complete reel with reel spool magazine and core shaft puller plus the devices required to operate it so as to maintain, as much as possible, the characteristics of the produced paper during the winding process.

Together with ABB, Voith Paper supplied the equipment for the tissue machine electric drive and fan pump, as well as all the DCS control system with automation for the stock preparation line, other auxiliary systems for the tissue machine and a QCS quality control system. Voith Fabrics also provided the machine clothing.

The new PM 1 was put into operation at the Monterrey mill in July 2002. Approximately three months after the start up, the machine has already reached a production of 90 t/day of high quality tissue papers with basis weights between 13.5 and 15 g/m^2, produced from virgin fiber and/or secondary fibers. The current phase shows high dedication and commitment to optimize all machine processes and to adapt the production and speed levels to those for which the machine was designed.

Mario Gonzalez

Mill Director Copamex

José Peregrina

Copamex Research and Technology Director

"We expect that the innovative Nipco-Flex technology, developed by Voith Paper, will allow Copamex to be more competitive in the market, both in terms of price and quality, with its line of products for family hygiene. Private companies need the technological support from groups such as Voith Paper. The support and commitment by Voith Paper were very important for us, as these factors contributed in reducing the expected down times for the disassembly of the old PM and the erection/ start up of the new machine from the scheduled five months to only three months."

1

Lady Regio –
Tissue from Copamex wins recognition in Mexico

2

The TissueFlex equipped machine, high-performance Voith Fabrics clothing and applications know-how from Voith Paper are considered fundamental to Copamex success.

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Fig. 1: *Lady Regio Tissue is recognized as a premium brand in Mexico for its bulk, internal strength and softness.*

Fig. 2: *Voith's Omega 2 press fabric provides optimum sheet dewatering and transfer to the Yankee Dryer cylinder.*

Fig. 3: *Gustavo Elisei (left) of Voith Paper Brazil and Fernando Lara Muñoz (right) of Voith Fabrics Mexico provide on-site technical expertise at the Copamex Monterrey mill.*

Fig. 4: *Fernando Lara Muñoz (left) leads Voith Fabrics' sales and service effort at Copamex, working closely with Max Molina (right), Copamex machine superintendent.*

In less than a year after Copamex introduced Lady Regio bathroom tissue, it has become recognized as the best quality brand in Mexico (Revista del Consumidor/Consumer Magazine; January 2003). Says Juan Manuel Rojas, marketing manager for the Consumer Products Division at Copamex, *"A big effort with market studies and focus groups helped us develop a tissue product that consumers in Mexico now choose by a wide margin."*

The market study to determine consumer needs and desired product attributes coincided with the planning and engineering of the Voith tissue machine. The product market survey indicated consumers want tissue that is soft and bulky, yet has sufficient internal strength. This helped drive the decision by Copamex to invest in the Voith TissueFlex shoe press technology.

Rojas is quick to add, *"We are producers of consumer products for the Mexican market, not machine builders and clothing manufacturers. Voith listened to our needs, delivered the right machine, fine tuned the clothing and continues to help us optimize long after startup."*

The Making of Lady Regio

Lady Regio is made in the Copamex plant in Monterrey, Mexico, on a Voith crescent former style machine, which includes TissueFlex shoe press technology. Starting up last July, Copamex was producing 90 tons per day of high-quality tissue after only three months of operation. In less than a year after startup, the tissue maker has reached 102 tons/day and a 90% efficiency rate.

According to Mario Gonzalez Quiroga, Copamex mill manager in Monterrey, *"Voith has played a central role in our success through their broad commitment to helping us achieve desired objectives of runnability and sheet quality. The proper machine clothing is essential to producing the balance of bulk and softness we seek."*

Gonzalez Quiroga says that Lady Regio, which requires a special balance of softness and bulk, can only be made on the Voith machine. While he acknowledges that a special blend of virgin fibers and eucalyptus pulps is important to the properties of Lady Regio, he notes, *"The combination of technology, process know-how and talent from Voith have smoothed the way for our initial success and gives us confidence that we will continue to excel in the marketplace."*

Runnability, Fewer Breaks

Says Max Molina, machine superintendent at the Copamex mill, *"Bulk comes from the mix of fiber and clothing application. Fernando Lara Muñoz of Voith Fabrics has led an effort to match forming and press fabrics to our machine. Now, we have the bulk we desire and longer wire life, too."*

Molina suggests that when making the sheet of Lady Regios' two-ply it is more difficult to achieve the softness and bulk targets. As he puts it, *"The combination of Voith's machine and fabrics makes a very difficult task rather routine."*

The machine clothing is contributing to a uniform sheet moisture profile, resulting in fewer breaks, and the high overall machine speed comes from the ability of the forming and press fabrics to remove water with high efficiency, according to Molina.

Voith Tissue Technology to Fit Market Needs

The TissueFlex concept is a method of pressing the sheet against the Voith Yankee Dryer with a wide shoe press nip. Since its market introduction two years ago, there have been eight commercial

Santiago Garza

Copamex Logistics Manager

Copamex logistics manager, Santiago Garza, suggests that there is a movement toward better quality in Mexico and that consumer opinions are finding their way into Mexico's products.

In his words, *"Consumers have options that they never had before with products made in Mexico. They set a standard and encouraged pride in workmanship.*

Mexico needs to keep growing based on quality products for the consumer and have a good atmosphere inside our mills. When people are treated well in the plant, they have a sense of ownership.

At Copamex, being more productive, more active, more involved with fresh ideas is our approach. And we try to follow the market niches – this is our target."

applications of TissueFlex. The design involves pressing the sheet against the hard Yankee over a longer and, very importantly, lower nip pressure. The lower nip intensity does not excessively reduce the sheet's caliper, thus retaining bulk. The longer nip and resulting increased contact time between the TissueFlex press and the hot Yankee surface provides additional drying, while preserving the key product objectives.

The Copamex TissueFlex installation was the third new machine so equipped. The other applications are press section rebuilds.

Forming the Sheet

By purchasing a complete new machine, you can receive the benefits of the Voith headbox, which delivers a uniform jet to a state-of-the-art crescent former configuration.

The sheet is formed on a Voith Enterprise forming fabric that provides a high-quality, uniform sheet appearance. The sheet width is precisely determined by the Voith trim beads, which are specially engineered and extruded onto the fabric at the Voith manufacturing plant.

Pressing and Drying the Sheet

The sheet is then transferred to the TissueFlex nip by Voith Fabrics' Omega 2 press fabric. Prior to entering the TissueFlex nip, the sheet is dewatered through the Omega 2 fabric matrix and suction pressure roll. With this equipment and clothing concept, the sheet is lightly pressed and transferred at the TissueFlex Press while the caliper is mostly maintained.

The Omega 2 press fabric incorporates a patented Flow Control® membrane, which reduces sheet rewet by limiting water migration back to the fabric's surface upon exiting the press nip. This is critical in a shoe press because the longer nip dwell time increases the chances of water returning to the fabric's surface.

With the sheet dryness maximized at the nip, the machine is allowed to run at a higher speed and thus improve productivity.

The other vital clothing component is the Voith QualiFlex sleeve, which completely encloses the TissueFlex roll. It is made of specially designed reinforced polyurethane and can be supplied with a smooth, blind drilled or grooved surface. The material composition and manufacture of the sleeve is both complex and critical to the machine's success. The Voith QualiFlex sleeve, together with the Voith press fabric, has proven to help achieve the goals of the machine. The resilient sleeve maintains its integrity with each revolution and achieves excellent operational life.

The tissue sheet is further dried by the Voith Yankee cylinder and the Andritz-ABB Hoods. The sheet is then reeled, trimmed on the winder, sent to converting to be processed into tissue rolls, packaged and distributed.

Fig. 5: *Copamex produces over 100 tons of high quality bathroom tissue every day at its Monterrey, Mexico, mill.*

Successful Startup

A team from Voith Paper and Voith Fabrics assisted Copamex personnel with the startup of the new machine. The group performed normal fine-tuning once all the equipment was commissioned. Optimization of the system components and machine clothing continued in conjunction with the Copamex furnish.

In short order, the machine meets quality objectives and produces a well-formed sheet and firm, bulky rolls of Lady Regio bathroom tissue.

From a productivity standpoint, the machine started up quickly and was soon producing at a speed of 1,600 mpm. An operating speed of 1,800 mpm was reached soon after.

Partnership Model

Santiago Garza, Copamex logistics manager, sums up the relationship with Voith by saying, *"Suppliers are important to us. We are confident with the Voith brand. Voith's machine, clothing, spare parts and service are working. We are trying to build this kind of relationship in everything we do."*

As Garza sees it, *"Copamex and Voith have formed a partnership in the manner in which today's business can be conducted best. Voith can deliver a complete platform of equipment and clothing to work in unison by understanding the needs of Copamex."*

One recent example of the partnership was a successfully completed optimization project. Copamex and Voith personnel worked together to precisely measure and maximize sheet width delivered to the TissueFlex press and Yankee cylinder. Ultimately, redefining the location of trim beads on the Voith Enterprise forming fabric and rebuilding the converting winders with wider embossing rolls achieved the maximum usable sheet width and productivity thus reducing trim waste.

According to Fernando Lara Muñoz of Voith, *"With our Fiber Systems, Voith Paper and Voith Fabrics groups working together, we're able to partner with Copamex to meet the combined goals of top tissue quality at a high and efficient rate of production."*

Leaving nothing to chance –
Janus MK 2 calender precommissioning for Bowater Catawba, South Carolina, USA

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Despite the growing complexity of production lines these days, faster erection and commissioning are increasingly important for return on investment – and often decisive for getting the order in the first place. Voith Paper has tackled this challenge so successfully that in recent years we have set up a number of world records for erection and commissioning times. This article about the 8-roll Janus calender for Bowater shows what lies behind such achievements.

Fig. 1: *Janus MK 2 calender during erection and precommissioning in Krefeld.*

Fig. 2: *Hydraulic unit supply piping to the Janus MK 2 from the Nipco roll test rig.*

The project can be summarized as follows: Bowater installed their PM 3 in 1968 as the world's fastest newsprint machine at that time, but with the ongoing decline of US newsprint prices in recent years, LWC production became a more worthwhile alternative. Voith received the order for rebuilding the line accordingly with an EcoCal calender, Speedsizer, coater, IR afterdrier, Janus MK 2 calender, Sirius and two drum slitter/winder rebuild.

Effectively, PM 3 thus became almost a completely new machine.

The contract specified no more than 46 days between shutting down the old line and starting up the rebuilt PM 3. To comply with such a tight schedule, a lot more is required than the conventional system of site erection unit by unit. This demanded complete pre-assembly of the calender, but that was not enough: to provide the necessary security, complete precommissioning was also required. This article mainly deals with the precommissioning and testing procedure rather than pre-assembly.

Pre-assembly

Fig. 1 shows the Janus MK 2 calender in the Voith erection hall – a stately machine 15 m high x 22 m wide x 15 m long weighing 700 metric tons. About 7,500 man hours were required for pre-assembly.

Precommissioning and testing

Precommissioning was done almost entirely with original components and equipment. One of the few exceptions was the Nipco hydraulics unit. Due to the size of the oil tank, Nipco roll control and loading was taken over by an existing hydraulics unit used for testing all Voith Nipco rolls. By installing about 400 metres of hydraulic piping together with numerous cables and data buses, this large unit has been made ready for precommissioning other complete calenders in future. All the structural modifications made will, of course, be retained, so that in future precommissioning in the Bowater style can easily be carried out in Krefeld. Fig. 2 shows the permanent hydraulic link now installed for the Nipco test rig in the final-erection hall.

Since the original valve banks, (Fig. 3) required for zone control of the Nipco

Fig. 3: *Zone control cubicle for the Nipco rolls.*

Fig. 4: *Auxiliary roll drive for the calender closing tests under additional load.*

Fig. 5: *One of the regular precommissioning meetings.*

Fig. 6: *Calender acceptance and functional testing.*

Fig. 7: *Customer training on the Janus MK 2 calender.*


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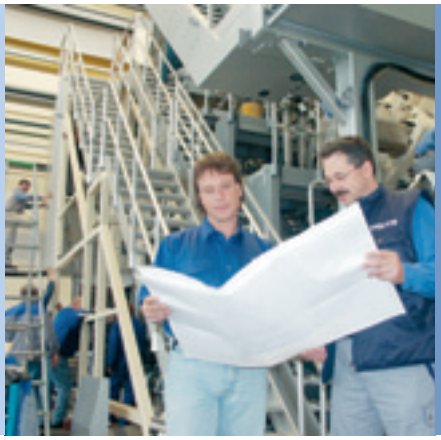
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rolls during precommissioning, were not available because site piping work was already underway in Catawba, the valve bank manufacturer provided mock-ups for simulating pipe connections. These mock-ups included all pipe connections in the right positions and sizes, thus enabling the piping to be laid so precisely that when the original valve banks were installed later on, everything fitted together like the proverbial hand in glove.

A main purpose of precommissioning was to carry out functional tests. These covered roll stack closing, load increase, quick-release stack opening and – last but not least – checking and adjusting the nip line force distribution with pressure-sensitive paper inserts. Furthermore, all pneumatic units were comprehensively checked and adjusted for perfect operation, such as the roll feed system, doctors, guillotines, blower air settings for web break monitoring, etc., etc.

All settings were entered in the quality control checklists and acceptance records which had been prepared in advance.

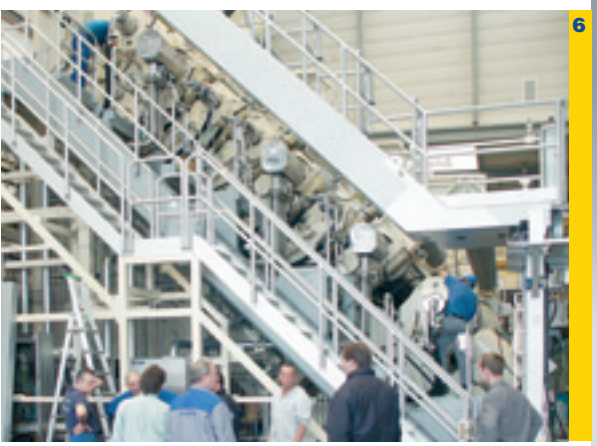
To check and optimize all functions of the Janus MK 2 floating stack – opening, closing and calender load increase – the drive motor on roll No. 7 was replaced with an auxiliary drive for precommissioning purposes **(Fig. 4)**.

Precommissioning work was facilitated by first putting the mobile inspection platform into operation. This made almost every part of the calender easily accessible at all times.

Thanks to complete installation of all structural steelwork on tender and drive sides, as well as the drive framework, cardan shafts, safety hoods and motors – including a timber mock-up of the calender columns on site in Catawba – the precommissioning tests also included interference checks.

A special feature of the Bowater calender is its control system. Instead of the Siemens S7 system normally used by Voith, Bowater wanted this machine fitted with General Electric GE 9030 controls. For precommissioning, this control system was completely installed and connected including the original switchgear cubicles, so that all functional tests could be carried out with the original control system software. As a result, all the program adjustments and parameter settings normally requiring considerable time during site commissioning, were already done in the workshops – which was greatly appreciated by the Bowater commissioning engineer:

"It's a great feeling to know in advance that the control system is one hundred percent dependable!"



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To familiarize the staff adequately with the GE control system and its programming interface, precommissioning was done with the actual site operating personnel. This represents another step in optimal know-how transfer right through the project, from design to erection to startup in Catawba.

Daily status discussions held on the spot with all concerned – erection, design, commissioning and quality control specialists – helped to ensure smoothly coordinated testing.

All in all, about 30 people were involved for about 4 weeks in the precommissioning preparations and testing.

During precommissioning in the work shops, a 1-week training course for Bowater personnel was held in Krefeld. The instructors were thoroughly prepared and put together a very effective training program. With a well-balanced mixture of theory and practice, this held the attention of all participants from beginning to end. And when our guests finally said goodbye, they had no more open questions. Hardly had they arrived back in Catawba when they mailed us the following statement:

"The preassembled Janus calender is very impressive. We are all amazed how thoroughly well thought-out, precommissioned and tested this machine is. The entire Voith team also did a fantastic job with regard to training and preparation. We look forward with pleasure and excitement to the first startup."

Summary and conclusions

Never before has the Finishing Division carried out such a comprehensive precommissioning.

We followed our motto "Leave nothing to chance" systematically and uncompromisingly. And that certainly paid off:

- Errors were discovered in good time and immediately corrected. On site, we could, therefore, concentrate on optimization without time-consuming troubleshooting and delays.
- All findings were documented and fed straight back to the design and automation specialists.
- The substantial efforts of this very detailed work shop precommissioning significantly shortens site commissioning time, which, in the end, has considerable advantages for Voith as well as the customer.

We clearly spent a lot of time and trouble getting the calender optimally fit for site commissioning. And, as shown by the picturebook startup last March, that paid off in no uncertain terms.

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Roll wrapping systems for the paper industry – a comparison

Before transporting finished paper rolls from the mill to consumers – usually printers – they have to be wrapped to protect them from damage and climatic effects. This article takes a critical look at wrapping materials and machinery used worldwide today, and the main differences between them.

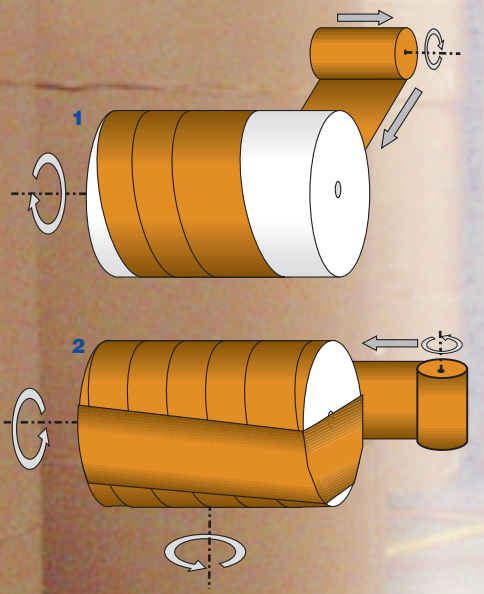
One of the main criteria is the kind of packaging material used. These days plastic wrap materials are used as well as packaging paper, or a combination of both.

Plastic wrap

There are basically two different kind of wrapping material: shrink wrap and stretch wrap, which is much thinner.

Paper rolls are hardly ever packed in **shrink wrap**, because the creases formed on each end make rolls wrapped like this unsuitable for storage in the vertical position. Shrink wrap is only used for special applications, such as for holding finished paper rolls on a pallet.

Stretch wrap is widely used in the paper industry, with two different wrapping methods for paper rolls: exclusively axial wrapping, or combined axial and radial wrapping.



Rolls wrapped exclusively radially with stretch wrap **(Fig. 1)** must be protected by end covers made of boxboard or corrugated carton. These end covers must be quite exactly the same diameter as the paper roll, since they are only held on by about 100 mm of stretch wrap overlap around the edge. While the smooth roll end-covers enable trouble-free vertical stacking, they are prone to fall out during handling by forklift truck or due to foil slackening, particularly as a result of long storage periods or light exposure. This also weakens the wrapped roll as a whole. Furthermore, rolls with commercial boxboard or corrugated carton end covers alone are not hermetically sealed against climatic effects. Without PE-coated covers, the paper roll can either lose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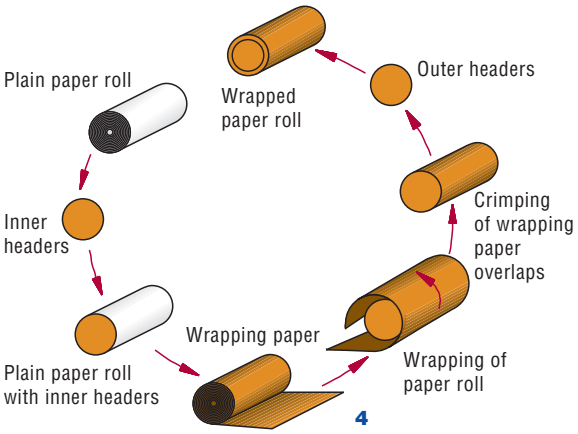

Fig. 1: *Radial wrapping with stretch wrap.*

Fig. 2: *Radial and axial wrapping with stretch wrap.*

Fig. 3: *Damaged stretch wrap.*

Fig. 4: *Classical roll wrapping procedure using packaging paper.*

its original moisture content or absorb too much moisture from the outside.

Radial wrapping with stretch wrap is often used for internal mill storage purposes, but can also be used as transport packaging for short distances and short storage times. By radial wrapping at a drum winder station while simultaneously rotating the paper roll axially on a turntable **(Fig. 2)**, the roll ends are also hermetically sealed with plastic wrap. As an alternative to the turntable, the plastic wrap dispenser can travel around the roll on a ring for axial wrapping. Additional protection by end covers is also possible, but not often used. Since the rather irregular end faces of rolls wrapped in this way are inconvenient for storage on end, combined radial and axial wrapping is only used for special types of paper.

In summary: plastic wraps offer the advantages of uncomplicated wrapping machinery and low-cost materials. The drawbacks are high UV-sensitivity, slackening of stretch wrap, and vulnerability to dirt. Furthermore, smooth plastic-wrapped rolls are more likely to fall off the forklift truck, particularly at low temperatures. And due to stretching, even slight tears caused by forklift truck handling can rapidly turn into serious damage **(Fig. 3)**.

Some of these drawbacks can be avoided by wrapping plasticcovered rolls with paper as well. The simplest way to do this is with crepe-like packaging paper (Clu-Pack/Semi Clu-Pack), using the same equipment as for stretch wrapping.

Packaging paper

Packaging paper, the classical wrapping material, offers much better protection than plastic wrap. At the present time this is still the only suitable way of packing paper rolls for long transport distances and storage times.

Roll wrapping with packaging paper is made up of three elements **(Fig. 4)**. The roll ends are first protected from damage by covers made of board or corrugated carton. Then the roll is wound with strong packaging paper, overlapping about 150 mm at each end. This overlap is normally folded in automatically to hold the inner end covers firmly. And finally a PE-coated outer cover, made of packaging paper, is generally pressed on top of the inner covers and folded overlap, and then heat-sealed.

Together with the PE-coated outer end covers, the PE-laminated packing paper used for radial roll wrapping hermetically seals the entire roll, as required for the majority of paper products.

The outer end covers are generally fixed without any additional glue, by heat-sealing (plastifying) the PE coating and pressing at high force against the inner covers including folded overlap. This method ensures bonding of the inner and outer end covers over their entire surface area, and provides a smooth end face for easy storage on end **(Fig. 5)**.

Packaging paper mainly comprises kraft or testliner sandwich papers with PE lining. To ensure adequate wrapping strength, the roll must be wrapped at least two to four times, depending on the quality and basis weight of the packing paper. The wrapping can be further strengthened by glueing the outer layers together, either with cold or hot glue. Since the cost of hot glue is steadily falling, it is increasingly replacing the cold glue formerly used, which is difficult to handle and not very popular among the personnel operating and servicing the wrapping machine.

Instead of glueing the packaging paper layers together, the PE-lining of the paper can be plastified during wrapping in the same way as with the end covers by heating (infra-red radiation), and then the layers bonded together under pressure. The necessary pressure is already given by the weight of the paper roll as it turns on the support drums during wrapping. So the heavier the roll, the stronger the wrap – which is ideal for transport protection, but very difficult to unpack when the roll arrives at the printer. This makes automated or at least semi-auto-

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mated unpacking machinery indispensable (Fig. 6).

For smaller, lighter rolls, the pressure due to weight is often inadequate for strong bonding. In such cases there is no alternative to glueing the outer layers together.

Wrapping quality

Wrapping quality mainly depends on the materials used and on compliance with the close tolerances required for the end covers and folded overlap. Packaging paper made of strong kraftliner can be glued easily and folded sharply over the edges. In general the end overlap should not be less than 100 mm and not more than 150 mm, otherwise too much air will be trapped inside and may lead to bursting. The diameter of the inner and outer end covers must never be larger than that of the paper roll, but can be slightly smaller as long as the inner cover effectively protects the roll end from fold imprints and the outer cover can be securely bonded to the folded overlap.

The larger and heavier the paper roll and the longer the transport distance, the more important it is to use really high quality packaging materials.

Due to the small tolerances for end overlap, either many different packaging paper widths are required for the wide range of roll sizes, or alternative solutions must be used.

For example, radial wrapping can be done with two or more narrow overlapping strips. This not only enables an optimal overlap of 150 mm to be set irrespective of the roll size, but the overlapping paper strips can be glued together for greater wrapping strength. The drawback of this method is higher packaging paper consumption compared with the classical method using only one wide strip, and possibly problems due to beading formation.

With spiral wrapping, a PE-laminated strip of packaging paper e.g. 500 mm wide is wound at a sharp angle around the roll. The desired number of layers is automatically obtained by correctly selecting the angle or degree of strip overlap. Then the roll end edges are additionally wrapped at right angles with a constant overlap of 150 mm (Fig. 7).

Spiral wrapping is suitable for all roll sizes using a single width of packaging paper strip. This kind of wrap is stronger than classical wrapping with packaging paper, because the glued spiral layers closely encircle the roll without any folds and the vulnerable roll edges are better protected by additional wrapping. Even after long periods of storage in a damp atmosphere, the widest spirally wrapped paper rolls are still in excellent condition and perfectly protected optically as well.

Fig. 5: *Paper roll storage on end.*

Fig. 6: *Paper roll unpacking device.*

Fig. 7: *Twister spiral wrapping principle with edge protection.*

Fig. 8: *Twister roll wrapping machine.*

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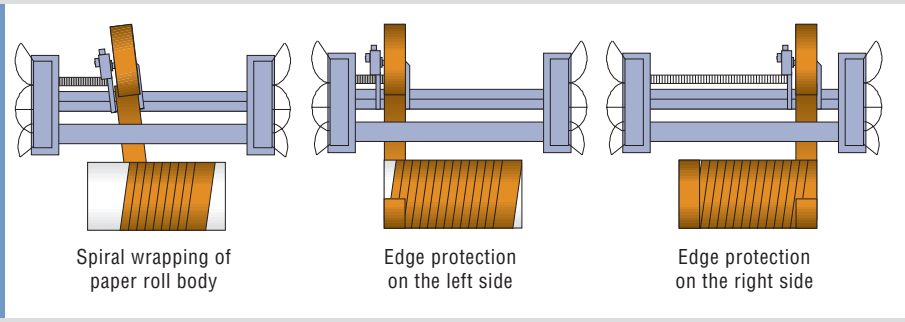

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There is no sign of the typical waviness ("fish-scale" pattern) otherwise caused by moisture penetrating the outer layers of paper. For the jumbo rolls longer than 3,000 mm already existing today, and in future for rolls as long as 4,300 mm, spiral wrapping is certainly the most cost-effective and highest quality wrapping method.

Spiral wrapping is not limited to any particular roll length, however. Even for the shortest rolls, it is a cost-effective alternative to the classical method and also offers the advantages of stronger wrapping with better edge protection and uniform fold overlap.

A closely fitting wrap is important for preventing the roll from falling out during handling by forklift truck and even causing accidents. Furthermore, paper is an extremely sensitive product, highly vulnerable to damage. So whatever the kind of wrapping, some paper grades and qualities are liable to marking of the top layers, particularly large diameter soft-wound rolls.

During classical wrapping with a wide strip of packaging paper, each fold forms a pressure point. With overlapping wrapping using several strips in parallel, this beading presses into the top layers of paper, and with spiral wrapping the edge of the spiral winding strip can also mark the top layers. Although such markings seldom prevent or hinder further processing of the paper, they are nevertheless undesirable.

To avoid marking during spiral wrapping, Voith Paper uses rubber-covered support drums in the Twister wrapping machine (Fig. 8). As in slitter-winders, two soft-covered drums reduce the specific line force and thus prevent the edge of the wrapping strip from pressing into the paper surface. This system even enables highly sensitive noncarbon copying paper, such as produced by August Koehler AG, to be wrapped with the Twister without any marking. Also the large LWC paper rolls produced at StoraEnso Hagen Kabel – up to 4,500 mm long and weighing nearly 10 tonnes – are perfectly packed free of marking thanks to these rubber-covered drums.

Summary and conclusions

Paper rolls are seldom wrapped with shrink wrap and only sometimes with stretch wrap. Mainly used for this purpose is packaging paper, which is the highest quality wrapping and the most economical for long transport distances and storage times, despite higher cost.

Inflexible wrapping systems with numerous different winding station widths are increasingly giving way to flexible modern roll wrapping machines, which cover the entire range of roll sizes with a single width of packaging paper.

Voith Process Solutions –
from source to solution

Andreas Arnhold

Service
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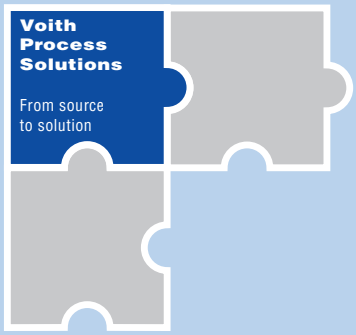
The economic environment the paper industry operates in has changed considerably over the last several years. As a result the industry is obligated to operate their mills in a more cost-effective manner than ever before. Voith Paper recognizes these new challenges and adapted its Mill Service activities to better help our customers meet these challenges. For this reason a new service concept called Voith Process Solutions has been introduced to the market.



As the industry permanently reviews and evaluates their core activities and makes cost cutting changes such as reductions in technical staff and reductions in capital spending, papermills now ask for technical support and operational recommendations in traditional subjects like:

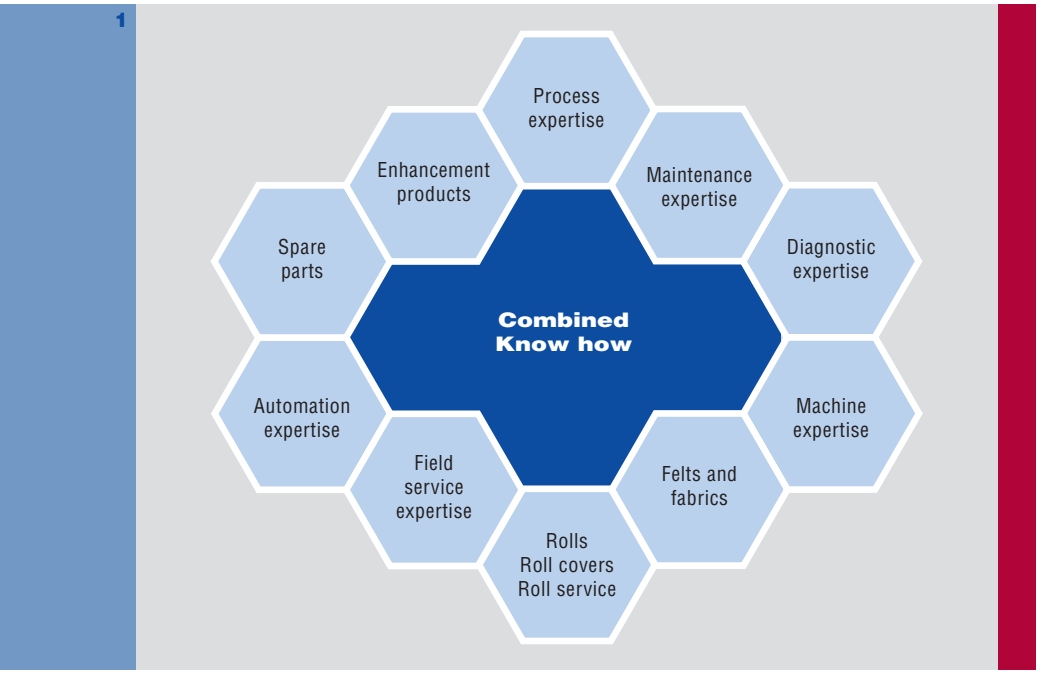
- Spare parts
- Roll service
- Roll covers
- Field service
- Maintenance,

but even more assistance is needed for:

- Technology, quality and process
- Special service (e.g. automation)
- Troubleshooting
- Process optimization
  – recognition of bottlenecks and optimization potential.

At a time when investment money for new projects is short, mills all over the world try to better utilize their existing equipment and thus search for machine

Fig. 1: *Combined Experience.*



efficiency increases and for cost effective operation. Life cycle management is the defining issue: improvements and solutions to increase productivity and quality over the entire lifetime of a paper machine or mill.

Voith is a full-line supplier offering products and components delivered by experienced people with product and process knowledge for all elements and disciplines of the papermaking process. Products and Services backed by this profound expertise result in service packages which have a high value to the paper industry (Fig. 1). The goal is to offer assistance from source to solution.

Voith Process Solutions has been put in place by Voith Paper to support paper mills and to help them better meet their needs. This step was taken in order to provide our services in a more concentrated and unified form. With this approach we provide advanced and effective solutions that impact the economic bottom line of the mills. These are solutions for achieving improvements in quality, quantity and costs, profiles, runnability, mechanical condition and energy.

This new concept was introduced in North America last year and has been successfully established meanwhile in Europe as well. The market acceptance is excellent, as the mills need what Voith Paper offers. Specialist teams have been established in Appleton, Wisconsin (USA) covering North and South America as well as in Ravensburg (Germany) covering Europe and Asia.

These teams offer the paper industry the most effective access to the needed specialists and tools. Within our organisation the right specialists can be recruited from different Voith locations all over the world – the best for the respective tasks!

However, before solutions, adjustments, maintenance assistance, optimizations or new and more efficient machine components can be put in place, the mill's targets have to be clearly identified. Before a recommendation can be given a detailed analysis has to be made. Prior to any analytical activities, a detailed discussion with the customers' specialists takes place in order to learn what their needs and expectations are. Only after the targets are clearly defined, proposals are prepared and offered.

Analysis and diagnosis come first. In order to start with an optimization program and to offer recommendations and solutions it is often necessary to carry out a machine audit which includes extensive machine condition tests and process testing. From such audits mills get a comprehensive collection of data and information describing the machine,

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process, and operation which can be used to plan on investment programs for future rebuilds or just for quick modifications. The most important aspects are:

- Define optimized scope for modernisation/modification
- Identify immediate corrective actions and maintenance or reconditioning needs
- Establish a base-line for long-term investment planning
- Reduce technical and economic risk for reusing existing components in a new configuration
- Investigate machine behaviour at different speeds.

To cover all these items different investigations have to be carried out which might include the whole production plant or which concentrate only on selected sections that are considered to be critical:

Stock Preparation
- Deinking plant
- Stock and water system layout

Paper machine
- Stock approach flow system (short circulation)
- Headbox
- Wire and/or former section
- Press section
- Dryer section
- Size press
- Reel

Finishing
- Coating section
- Calender

Converting
- Rewinder
- Winder
- Packaging plant

Electrical system
- Drive system (gears, motors)

Automation
- Field instrumentation
- Control systems (e.g. for CD profiles)
- DCS system
- QCS system

Auxiliary equipment
- Lubrication
- Vacuum
- Tail threading.

Fig. 2: *Resources worldwide.*

Figs. 3 and 4: *Scope of analyses.*

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- General papermaking Process Troubleshooting Tasks
- Paper Machine Operational Audit
- Complete Machine Surveys
- Machine Condition Analyses (mechanical)
- Wet End Pulsation Analysis & Stock Flow Survey
- Gas Content Measurements
- Advanced/Comprehensive Vibration Diagnostics
- Press Load Measurements
- Moisture Cross Profile Analysis
- Miscellaneous Mechanic Inspections
- Run-out Measurements
- Paper Sample Analysis (Tapio)
- Other Process Related Studies
- Acoustic Analyses
- Thermography Survey (High speed)

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- Forming Section Drainage Analysis
- Strobe Synchronous Video Survey
- Vacuum System Analysis
- Press Section Water Balance
- Press Section Efficiency Survey
- Press Fabric Conditioning Study
- Roll Cover Conditioning Study
- Dryer Section Hood Balance
- Dryer Section Steam and Condensate Study
- In-Mill Routine Predictive Vibration Monitoring
- Training Seminars
- Paper Machine Alignment Tasks
- Machine Economic Analysis Study

For all areas mentioned above Voith Paper Service has created and put in place service packages that contain well-defined studies. Specialized and experienced teams cover the scope from purely mechanical condition tests and inspections over extensive process audits and various paper quality tests to concept studies, capacity studies, simulations and operational assessments. Machine runnability and safety aspects are included as well **(Figs. 3 and 4)**.

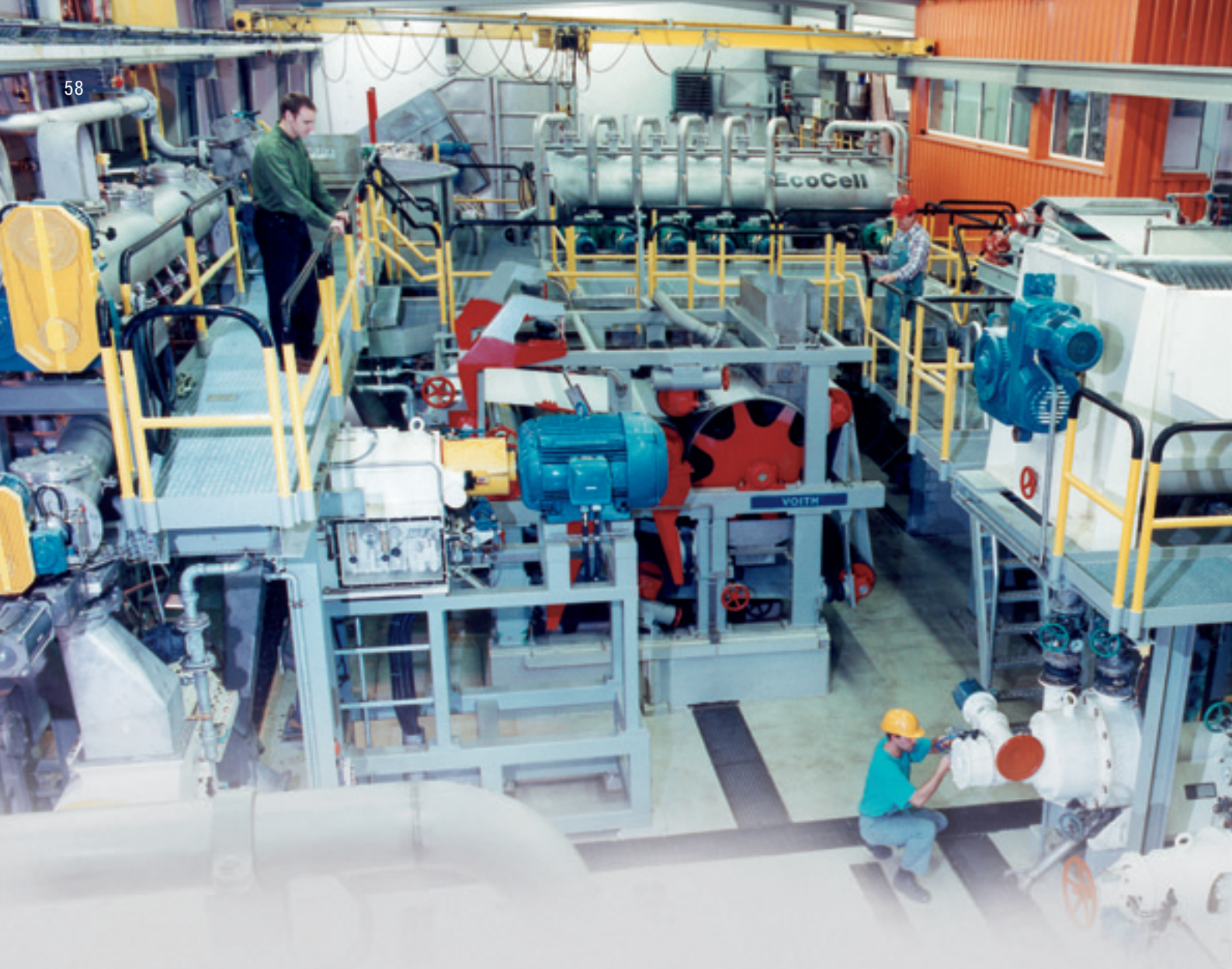
The result of these are recommendations which refer to general operation of the machine as well as to the mechanical status, the process and the improvement potential to increase the paper quality and production. The overall goals are to increase machine efficiency and to detect bottlenecks and to provide efficient solutions.

In this issue of twogether magazine we start with a series about the extensive capabilities of Voith Process Solutions. We will continue and give you more detailed information and examples about our new service concept and the background of this valuable product over the next few issues.

Today we start with our extensive opportunities for a detailed system analysis of the stock preparation including deinking plants. Another article deals with the possibility to do CD moisture profile measurements based on NIR technique on almost all positions in a running papermachine.

In the future you will find articles which include examples for machine studies through the entire papermachine and adjacent sections, mechanical condition tests, concept and capacity studies, dryer section surveys, reel tests...

Your issues are our issues.
From trouble shooting to process optimization!



Dr. Volker Gehr

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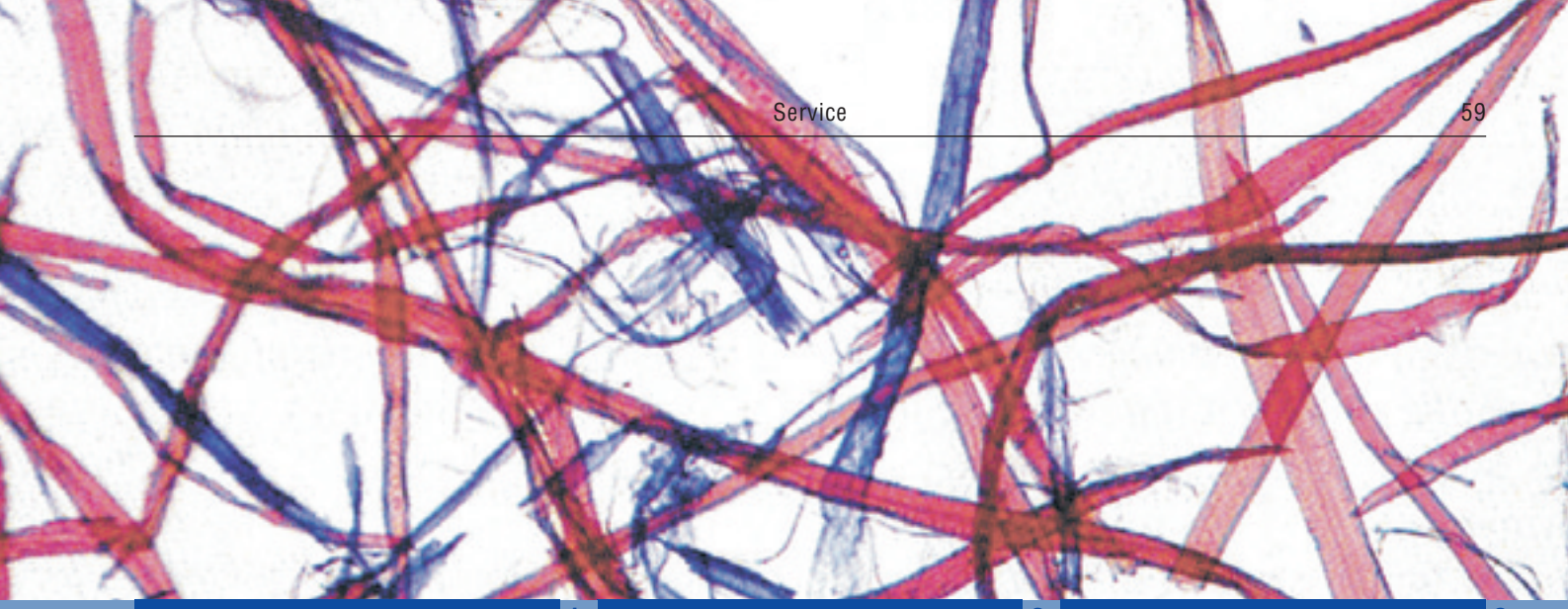
Voith Process Solutions
From source to solution

Technological services from fiber to paper

Technological services from fiber to paper – a worthwhile investment for the paper industry?

Before answering this question, we need to define the term "Technological Services". This article gives an overview of how such services in stock preparation can make paper and board production significantly more efficient. Maximum efficiency, whilst still maintaining the required stock and paper quality characteristics, can only be reached by optimum process management (e.g. machine layout and water loop management) and by best possible long-term operating efficiency of the stock preparation system (e.g. machine selection and fine tuning, plant and control engineering).



Optimization measures for improving efficiency and/or quality 1

- Increased stock preparation capacity
- Improvement in furnish and hence paper quality
- Reduction in fiber losses and increased fiber yield
- Savings in fresh water, energy and additives
- Millwide technological and/or thermal system balancing
- Water management (fresh water consumption, specific effluent volume)
- Reduction in disturbing components and depositing

Short-term optimization measures on-site for improving stock preparation plant performance 2

- Condition diagnosis
- Problem identification
- Definition of objectives jointly with the customer
- Check-out of process and machine parameters
- Check-out of control strategy and instrumentation
- Listing of weak points
  – Immediate process and machine optimization
  – Action catalogue for initiating further engineering and project work, where necessary

System analysis for optimum plant operation 3

- On-site analysis of your stock preparation process and documentation of actual plant conditions, including comprehensive data recording, sampling, laboratory evaluation and technological assessment
- Detailed calculations for individual processes right through to a millwide balance, together with simulation of optimum process conditions for:
  – COD content
  – stock flow
  – water and effluent management
  – thermal management
- Joint establishment of concrete system solutions and optimization proposals together with you, our customer

Well-proven methods for optimum process management and functionality are:
- System analysis/optimization, pre-studies and
- Customer trials.

System analyses, optimization and pre-studies

A wide range of optimization possibilities are available in paper and board production. These are generated by the constantly increasing demands on furnish and paper quality on the one hand and necessary measures for improving efficiency on the other **(Fig. 1)**.

Concrete measures can be derived for the required improvements and these can either be implemented in the form of immediate system optimization **(Fig. 2)** or by comprehensive system analyses **(Fig. 3)**. Selection of the best solution depends on the specific objectives or problems and in each case can generally be defined in initial discussions between you, our customer and Voith Paper.

So far we have carried out about 70 extensive system analyses and innumerable optimizations. The benefits of such measures are illustrated in **Figs. 4 and 5**.

Another Voith Paper core competence, apart from system analyses and optimization of existing plants, is project risk minimization for extensions or new plants. This needs in-depth analyses and pre-studies (feasibility studies, pre-engineering) and requires a wide range of multi-disciplinary expertise and teamwork. Extensive pre-studies over the past few years have substantially further improved engineering reliability – particularly for extensions – as regards:
- Specific fresh water consumption
- Specific effluent volume
- Thermal balance (e.g. heat exchangers)
- Sludge and rejects systems
- Process and automation concept

In addition, mills are increasingly wanting a comprehensive life-cycle support for which Voith Paper have developed their Process Solutions programme – see also a separate article on this subject in this issue.

Customer trials

Systems and individual machine trials in our Research and Technology Center in Ravensburg, Germany represent another tool for improving engineering reliability and for optimization work. Based on a given furnish mixture with the necessary

The new laboratory refiner for quality control and laboratory trials.

4

Benefits of system analyses and optimization

- Detailed report on your actual plant condition by highly experienced Voith specialists
- Indication of concrete system solutions and optimization potentials or immediate action to optimize your plant technology and efficiency
- Project risk minimization through in-depth analyses and pre-studies (feasibility studies, pre-engineering)

5

Cost reductions through short-term optimization measures

Examples	Measures	Cost reduction
Packaging paper plant, 800 t/24 h	Technological optimization of the complete stock preparation system	Euro 1,800,000 per year by increasing stock preparation plant capacity and improving paper machine runnability
Tissue plant, 250 t/24 h	Technological optimization of slotted screening	Euro 360,000 per year by minimizing fiber losses
Newsprint plant, 500 t/24 h	Technological optimization of flotation	Euro 62.000 per year by reducing additives

6

Advantages of trials in our Research and Technology Center under simulated mill conditions

- Customized solutions
- Risk minimization when implementing new process concepts
- Optimization proposals for existing systems and machines
- Comprehensive documentation of trial results

quality characteristics, such trials enable definition of optimum machine layout and settings for achieving the desired finished stock quality requirements.

Every kind of stock preparation system can be set up and simulated in our fully equipped Research and Technology Center. About 35 customer trials per year have been carried out on average since 1978 alone. These figures reflect the enormous amount of stock preparation know-how we have built up over the years. An important factor to note is that the results can be fully used as basis for mill operation since all our laboratory machines and equipment are in our smallest industrial scale size.

Another highlight is that we can provide combined stock preparation and paper machine trials, since our Board and Packaging Paper Division's trial paper machine is also located in Ravensburg in the same building.

Our Research and Technology Center also incorporates a very well-equipped laboratory, providing reproducible results by using standardized data recording on precisely calibrated measuring instruments (CEPI Comparative Testing Service). More than 80 different test procedures can be carried out according to an extensive variety of norms such as DIN, ISO, TAPPI, SCAN, etc. **Fig. 6** summarizes the benefits of customer trials in our Research and Technology Center.

The technological services summarized here as part of Voith Paper's Process Solutions will be described in more detail in subsequent issues of twogether magazine, using concrete examples.

Analysis of the paper moisture CD profile during operation at almost every position via adjusted Near-Infra-Red (NIR) measuring technique

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Usually the moisture CD-profile of the paper web is automatically recorded by the QCS (Quality Control System) of the paper machine together with other important quality information. In case of irregularities in the moisture CD-profile of the paper web these standard measuring points are not sufficient to make a quick and accurate classification of possible causes. With the help of a mobile NIR-(NearInfraRed) moisture measuring system, it is possible to locate the origins of poor moisture cross profiles with comparatively little effort.

Why are the usually installed QCS-scanners not sufficient?

Often moisture profile problems can be easily detected, whereas their causes can only be found with strong efforts. As a first step, it is necessary to quickly locate where the moisture variation originates. The QCS can only partly help because data is recorded after the paper web has passed the paper machine sections. Therefore it is not possible to define exactly in which section and to what extent the preceding sections influence the moisture profile.

Generally the following sections influence the moisture CD-profile:

- wire section (e.g. homogeneous fibre distribution and draining)
- press section (e.g. conditions in the press nips, press felts etc.)
- pre-dryer section (e.g. condition of cylinders, etc.)
- after online coating/size press (e.g. uneven sizing)
- after-dryer section (e.g. condition of cylinders, etc.).

Present techniques and possibilities

The moisture CD-profile is automatically recorded at only one or two points in the paper machine. Therefore it is necessary to use a method which can be used at any point of the paper machine in order to determine where moisture problems occur.

One method is called the gravimetric method and is used often after the press section. It simply involves weighing the paper samples (dry sample analysis) which have been torn off the paper web. This method can be used for calculating the approximate average moisture content of the sheet.

Disadvantages of the gravimetric measuring method are the low resolution in

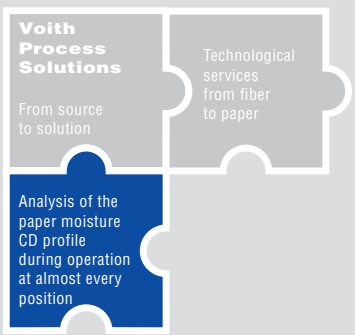
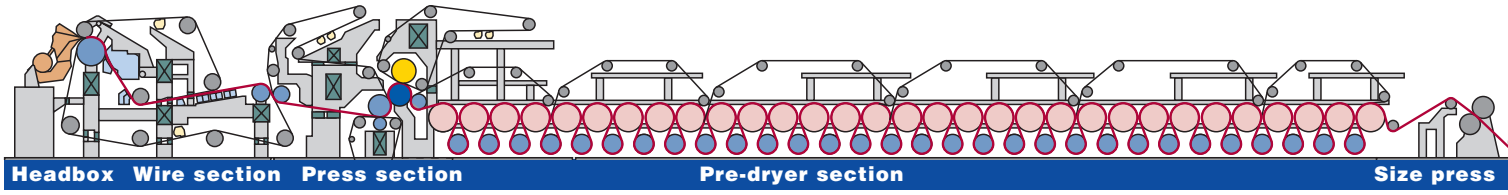


Fig. 1: *Paper web process in the machine.*

Fig. 2: *Installed measuring system after the press section.*



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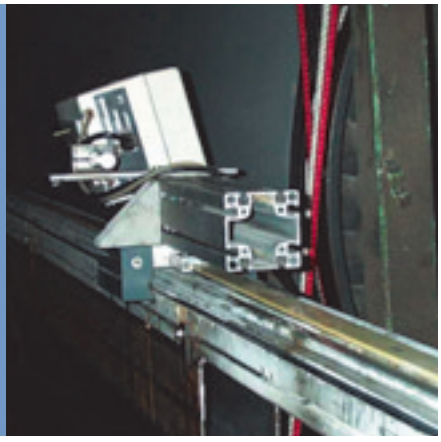

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cross direction and the rough values of the measurements. However the biggest disadvantage is the interruption in production for every measurement. This usually prohibits a series of tests or trials. Therefore, this method does not allow optimizing steps to be checked quickly.

What does the new technique offer?

In the following paragraphs, the NIR-(NearInfraRed) measuring system is described, which avoids all of the disadvantages of the gravimetric method.

The measurement system is based on the principle, that water absorbs certain wavelengths in the infra-red light range more than other wavelengths. Therefore, a filtered infra-red beam of a determined wave length range is transmitted onto the paper web in the machine. By measuring how much of the light is absorbed by water molecules in the paper, the moisture content of the paper can be calculated.

In order to use this measurement technique, a crossbeam rail is installed in the desired paper machine section. A small sensor crosses the paper web on this rail. The sheet support material (e.g. dryer felt) has a negligible effect on the measurement procedure.

The installation of the rail is normally done some days before the actual measurements during a planned machine shutdown. So there is no loss of production. The sensor can be installed and operated during production. Fig. 2 shows an example of an installed measuring system at a dryer cylinder.

The positioning required for an accurate measurement will be done by an engineer on site.

What is the sensor accuracy?

The sensor can measure the relative CD moisture profile on site, which is the moisture deviation relative to the mean moisture. This is sufficient to determine the influence of components in the paper machine e.g. the steam blow box or the press felt settings. In order to obtain the exact moisture values, the sensor must be calibrated in the lab. The calibration takes into account the type of paper used, as well as the influences of the paper machine. Nearly all grades of paper can be analyzed by this method. After the calibration, the sensor can measure the CD moisture profile with a relative accuracy of up to 0.1 %-moisture. The absolute accuracy is up to 1 %-moisture.

The resolution of the moisture CD-profile is limited only by the size of the measured area (Ø 25 mm). For example; with a paper width of 5,000 mm, the maximum number of measuring points is 200. Whereas a resolution of 50-100 mm is usually sufficient.

Advantages of the NIR

To summarise, the NIR-measuring system offers the following advantages:

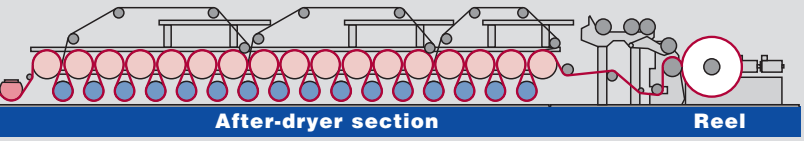
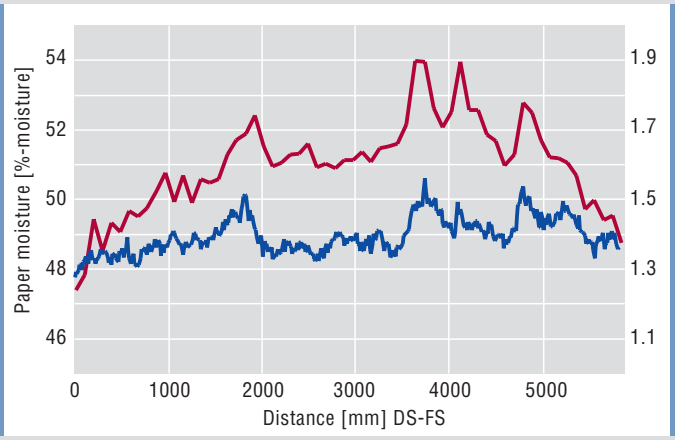


Fig. 3:
Paper moisture at the beginning of the pre dryer section.
Paper moisture at the end of the pre dryer section.

Fig. 4:
Paper moisture at the beginning of the pre-dryer section before press felt change.
Paper moisture at the beginning of the pre-dryer section after press felt change.

3



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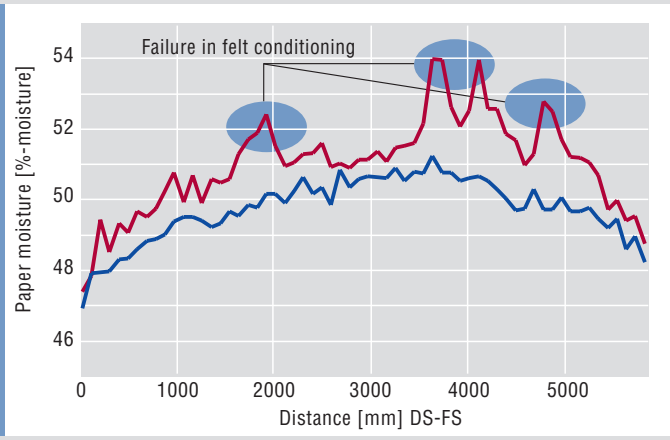

- measurement does not interfere with production
- it can be used almost anywhere on the paper machine
- the measured values are supplied accurately and can be used for optimizations
- the measurement point distance is smaller and variable, compared to conventional methods.

Practical experiences

Over the past few years the NIR-measurement system has proven itself during machine condition analysis, troubleshooting and machine startups. The following example shows how this system was used for problem solving.

Example: over-dried CD-profile before size-press

In this case the sheet was over-dried to avoid problems in the size press that could arise because of the very irregular moisture CD-profile.

The NIR measurement after the press section proved that the paper entering the dryer section had already very dry edges and some wet peaks across the profile (Fig. 3).

It was possible to optimize the press to prevent dry edges. This allowed the mill to increase the moisture ahead of the size press by 1 %. This gave the mill not only immediate energy savings (less steam consumption) but also the option to speed up in the future.

NIR-measurements before and after the press felt change showed that the wet peaks in the CD moisture profile were caused by felt conditioning (Fig. 4).

Conclusion

It can clearly be seen that the NIR measuring system is a valuable tool for the papermaker. The system can quickly isolate problem areas during operation and allows for rapid optimization procedures. With a small amount of effort, considerable time and money can be saved.

The importance of achieving and maintaining benchmark threading performance

Elisabeth Rooney

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Maximum profitability is the ultimate goal of papermakers worldwide. Papermakers can only be profitable if machine efficiency is optimized and machine availability is increased. As a part of the integral machine process, threading has a significant impact on both machine efficiency and machine availability. These two key areas in turn contribute to the overall profitability.

Only the top 1% of paper machines realize the 97% global benchmark for machine efficiency. The rest, 99% of paper machines in advanced countries are only achieving an average efficiency of 80-82% in their process. One of the main reasons for this is inefficient and inconsistent threading performance. Not reaching the set threading benchmark consistently has a significant impact on the overall operation of the paper machine.

A key differentiating factor that sets the top 1% of paper machines apart from others is their consistent threading performance. The top performers can only maintain these high efficiency levels by repeatedly achieving their threading benchmark times. While the average papermaker achieves their threading benchmark less than 50% of the time, these top producers do so over 95% of the time.

Four Steps to Achieving and Maintaining Benchmark Performance

Any mill can achieve and maintain benchmark threading performance. There are four key steps in the process:

Baselining: Determining the machine's current threading process, its average threading times from key points on the machine, and its average number of breaks per 24 hours from each point (i.e. what is current machine performance?).
Benchmarking: Determining what the machine's threading performance should be, compared to similar machines with optimized threading processes (i.e. what should the machine's performance be?).
Process Optimization: Implementing new technology and processes to achieve the pre-determined benchmark performance level.
Process Sustainability: Implementing tools or processes to maintain benchmark performance over the long term.

Baselining

The first step is to clearly determine exactly what the current threading process is. This includes identifying everyone and everything used to thread the machine, reliability and safety issues, as well as servicing and maintenance of any equipment, training of operators etc. It is also important that the mill understand the collateral impact of its particular threading process on overall machine efficiency, manpower allocation etc.

Part of this threading process analysis should be a thorough review of the machine's downtime logs. To determine the correct benchmark, it is important to verify:

- Average number of breaks per 24 hours from various points on the machine (e.g. press section, dryers, last drying cylinder), and the average sheet to sheet threading time from each key point.
- Any collateral problems resulting from the current threading process (lack of spools at turn-up, excessive rope system failures, plugged broke pit etc.)

Only threading time should be included in these calculations, not downtime due to mechanical or electrical problems, equipment failures etc. In this process, the actual average sheet to sheet threading time for a particular machine from various start points is being determined by using the current threading process. This is then compared to a benchmark time specifically calculated for that machine.

Determining Benchmark

Determining the benchmark threading time is a very important step in optimizing the threading process. Once the current average sheet to sheet threading time is determined from various points on the machine, a benchmark time can be calculated. This is accomplished by using the sheet to sheet threading times from machines similar to the target machine. Reference machines must be essentially the same age and configuration as the target machine, and produce similar grades at similar speeds. Reference machines should have optimized threading processes already in place and operational. The sheet to sheet times for the reference machines are averaged, and in some cases a compensation factor is added to this average time to account for differences in basic machine processes.

Process Optimization

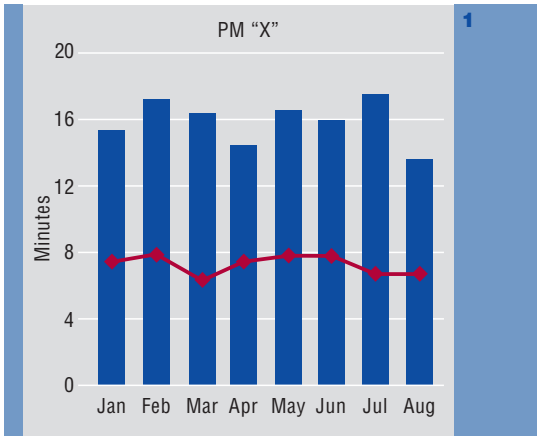
Once the threading benchmark is set and the current threading process evaluated, the mill can determine what the cost of non-benchmark performance is. Various options to optimize current performance to achieve benchmark performance can be analyzed, and a plan can be developed to implement the most appropriate solution.

The Impact of Achieving Benchmark

Only by consistently achieving benchmark threading times can the global benchmark for machine efficiency be reached. An ideal threading process can have a significant positive collateral impact on the overall machine performance, safety and costs.

Once the target machine's average number of breaks and average threading times are determined, and a benchmark time established for the machine, the next step is to find out what percentage of time the machine is already threading at benchmark or better using its current (un-optimized) threading process. One of the biggest differences with the top performing machines in the world and the rest, is that the top performing machines **perform consistently**. In other words they achieve their threading benchmark or better performance more than 95% of the time. Below is an actual customer example from one of Voith Tail Threading Group's Threading Assessment Reports (TEAMS).

Fig. 1: *Benchmark threading time (indicated in red) compared to the actual average threading time of a North American paper mill.*

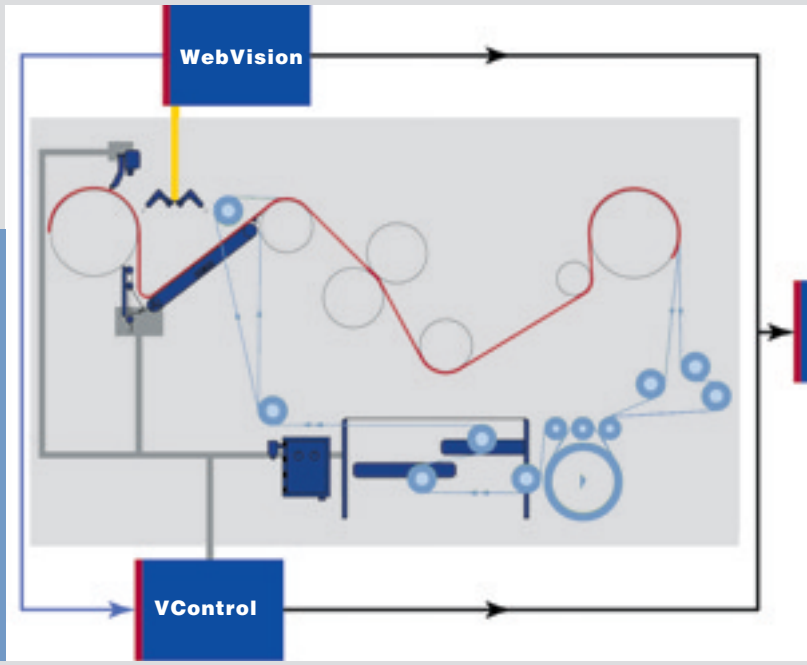


This machine, on average, has one press section break per 24 hours (@31.4 minutes average), one dryer break per 24 hours, (@28.7 minutes average) and 3 end section breaks per 24 hours (@14.9 minutes average). Benchmark times have been determined for this machine (the red line in **Fig. 1**). Currently this machine, even with its un-optimized processes, already achieves threading benchmark 13.43% of the time from the presses, 21.68% of the time from the dryers and 34.57% of the time in the end section. However, when the impact of achieving benchmark times versus their current average times is calculated, the potential time saved is staggering.

Table: *Total annual savings (in minutes) realized from a consistent threading performance.*

Accumulative Annual Threading Savings			
	Current	**Benchmark**	**Savings (min)**
Press to Reel	10,833 (1/24h@31.4 min)	4,140 (1/24h@12.0 min)	6,693
Dryer to Reel	9,902 (1/24h@28.7 min)	3,450 (1/24h@10.0 min)	6,452
End Section	15,421 (3/24h@14.9 min)	5,175 (3/24h@5.0 min)	10,246
Total Savings			**23,391**

Fig. 2: *Overview of the components in the MSP threading process management solution.*



At the end of a 345 day year, the total potential machine availability gain is 23,391 minutes translating into 391 hours, or 16 days!

This is 16 days that this machine operated and did not make any product. This loss is avoidable. It is the result of 5 minutes here, 15 minutes there, 10 minutes over there i.e. an inconsistent, unreliable process.

In order to calculate a dollar cost of this loss, we recommend using operating costs, not lost revenue. This example and payback calculation does not include savings realized from collateral impact such as plugged broke pit, lack of spools at turn-up etc. In the current market, even if a machine is in curtailment for a part of the year, if it can run more efficiently when it is operating, the operating costs saved go directly to the bottom line.

For machines like the one in our example, operating costs range from $ 5,000-$10,000 per hour. The justification for optimizing the threading process on such a machine is obvious and the payback is immediate.

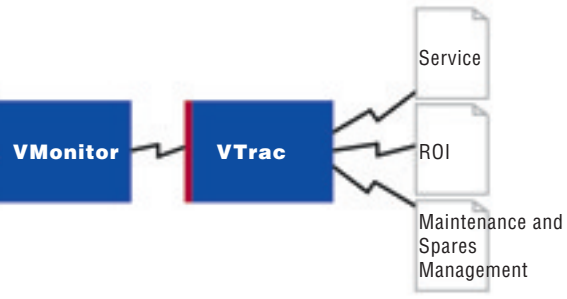
Sustainability

It is not enough to simply improve the overall threading performance. Once the benchmark threading performance is achieved, it has to be sustained. For the mill to gain the greatest system lifecycle ROI, the threading process must continue to perform at maximum performance levels over the long term. The biggest challenge today is not to simply achieve superior threading performance and safe operation at the lowest cost, but to maintain the efficiency gains and the ROI over the long term. It is critical to integrate service and maintenance (i.e. process sustainability) into the overall threading process.

Automated threading technology that dramatically and consistently reduces threading time allows more efficient manpower allocation and threading process monitoring. A more efficient threading process is the basis for any long term solution. This requires more than just good equipment and an appropriate application of the equipment in the machine. It requires process control. Sustained threading performance requires a control system designed to ensure that all parts of the process perform consistently, a system that instantly reports when any component or operation falls below the predetermined required optimum performance levels.

To accomplish this, Voith developed and patented a threading process and management solution, MSP (Maximum Sustainable Performance). MSP manages the entire threading process and ensures Maximum Sustainable Performance over the long term. The MSP management solution uses four key components:

- Visual Digital Recording Technology (WebVision)
- Equipment Controls Technology (VControl)
- Equipment Management and Tracking Data Base (VTrac)
- Communication Manager (VMonitor).



Once the threading process has been accurately defined, and then optimized, the MSP threading process management solution can maintain this optimum performance. It ensures fast, accurate threading system assessment and diagnostics, provides remote troubleshooting, eliminates operator variability, reduces downtime and lowers operating costs. In short, MSP gives the mill complete control of their threading process.

Key benefits of Maximum Sustainable Performance

Fully automated threading

The MSP system provides fully automatic threading operation which eliminates variability in the threading process, and removes operators from the machine during threading for improved safety.

MSP provides fast, accurate and effective troubleshooting and monitoring

The system keeps track of all the components of the threading system and logs threading performance. If there is a problem with any parameter that affects threading such as rope tension, plugged air jet, moisture content of the tail etc., VMonitor sends an appropriate error message to the operator. VMonitor diagnoses equipment components and machine parameters that affect threading so that problems are quickly identified and corrected.

MSP provides remote trouble shooting 24/7

VTrac maintains a visual and a data log of performance of specified system components allowing for effective remote troubleshooting. Mills with MSP are able to receive accurate remote troubleshooting assistance from threading experts 24/7 because technicians can connect to the system through a communications link and view exactly what is happening with the system currently and historically. Technicians can either make the appropriate corrections remotely or assist the mill to make them.

MSP provides maintenance and service management

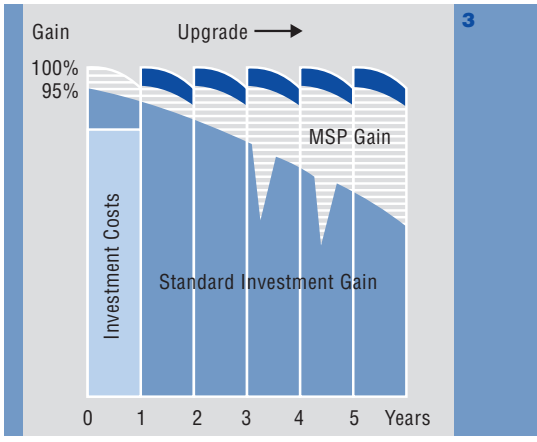
MSP provides ongoing performance logging, and complete system diagnostics to ensure threading performance is always sustained at maximum efficiency.

VTrack logs all data on the system, monitors equipment performance and sends appropriate messages to operators when adjustments are required. VTrack also sends messages to the operators when maintenance or service is required, when spares should be ordered to be on site for the next shut etc.

VTrack assists mills in making appropriate ROI based sustainability decisions

Maintaining an ongoing ROI, VTrack assists mills in making appropriate sustainability decision.

Fig. 3: *The importance of sustained performance in the threading process. MSP Life Cycle Management Tool Maximizing Customer Gain*
Investment costs
Investment Gain
MSP Costs
MSP Gain



Summary

Reaching and sustaining benchmark threading performance is a key factor in achieving maximum machine availability and efficiency. Only papermakers who consistently achieve their threading benchmark, can achieve global benchmark machine efficiencies.
However, once the threading process has been optimized to achieve benchmark performance consistently, steps must be implemented to ensure this performance is sustained. Without sustained benchmark performance, machine efficiency will rapidly decline. The MSP system was developed to help with the maintenance of the threading system and ensure consistent benchmark performance. The first MSP system is installed and operational at a mill in Western Canada. The 2nd system is currently being installed in a mill in the US.
The MSP solution is a proven diagnostic and control tool that allows a mill to easily and positively manage the threading process for sustained optimum results and increased overall machine efficiency.

CORPORATE NEWS

Krieger activities in Latin America

The successful track record of Krieger products in the Latin American paper industry goes back more than a decade. They comprise various drying systems with gas-fired infra-red heaters and air hoods for paper machines and coating lines, as well as the Krieger contactless web guiding system.

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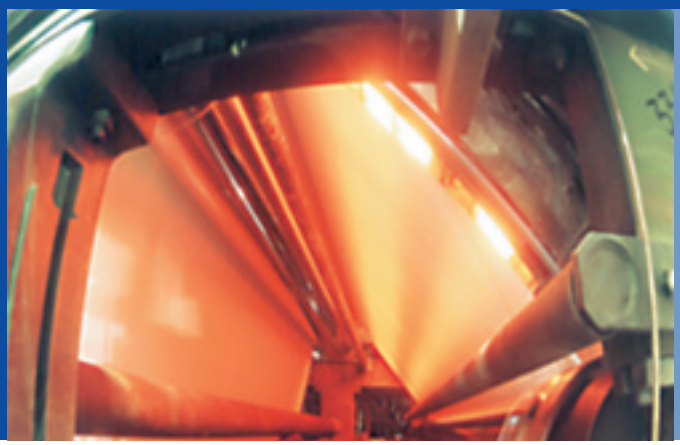

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Krieger's Latin American activities started in the early nineties, and until 1998 this market region was served by Krieger Corporation, Enfield/CT, USA.

In 1989 the first Krieger drying system, with gas-fired infra-red heater, went into service at Jefferson Smurfit in Venezuela. In the next few years Suzano, São Paulo, Brazil equipped their paper machines in the Suzano and Rio Verde mills with Krieger infra-red driers and a Krieger CB-Turn contactless web deflector system.

Afterwards, other leading Brazilian paper and board producers such as Votorantim Celulose e Papel, Ripasa, Klabin and Ibema also decided for Krieger infra-red drying systems, air hoods and web guiding systems.

Apart from Brazil, Krieger's biggest market region, the company's infra-red driers are now in service on production lines belonging to Smurfit/Mexico, Kimberly Clark/Mexico, Smurfit/Venezuela, Propal/Columbia, CMPC/Maule in Chile, and Fanapel in Uruguay.

Krieger IR driers now command more than 90 % of the Latin American market, due above all to their outstanding reliability. Customers also benefit from local service expertise with highly qualified technicians, supported directly from the Mönchengladbach headquarters in Germany.

Thanks to close customer relations, Krieger drying systems are adapted rapidly and dependably to different conditions. Efficient maintenance services and fast spare parts procurement ensure their high availability and cost-effectiveness.

Krieger can meet all kinds of specialized customer needs with its range of drying systems. For example, Krieger metal IR radiation driers are ideal for firing with the liquid gas (LPG) fuel widely used in the region.

The Brazilian market is always open to innovative developments, and it was here where the first Krieger CB-Turn contactless web turning systems was commissioned at the Suzano Rio Verde mill. This new concept not only improves web stability, but also reduces air throughput.

Fig. 1: *Installation at the Suzano Rio Verde mill, Brazil.*

Fig. 2: *Krieger infra-red drier (K6500 metal radiator, dual line installation between the blower and suction ducting of the air circulation system) in service at Ibema Brazil.*

Fig. 3: *Combined infra-red drier, similar to the installation at Ripasa Brazil.*

Fig. 4: *Krieger CB-Turn contactless web turning, usually installed after double and single sided coater lines.*

Fig. 5: *One Platform Design with Krieger integrated dryer, installed at Ibema Brazil in 2003.*

Fig. 6: *The Krieger headquarters in Mönchengladbach, Germany, currently employing 96 people in production, service, design, development, marketing, sales and management.*

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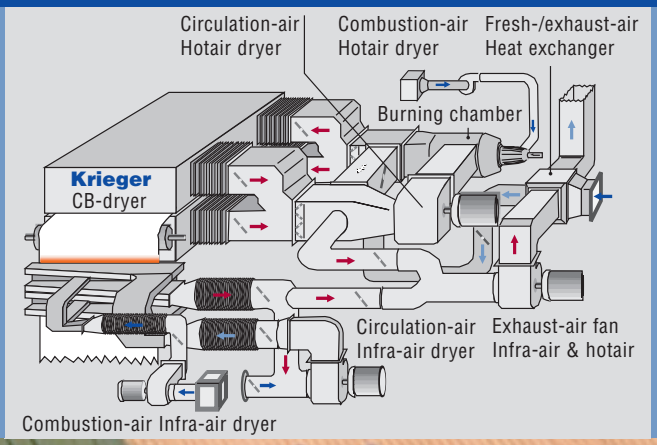

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PAPER CULTURE

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It can’t be cardboard – or can it?

The Kreuzberg district of Berlin has always been the home of eccentric characters and original ideas. Despite the building boom and all the changes Berlin has undergone since reunification, with impressive modern buildings made of glass and concrete, this district in the heart of the German capital has managed to keep some of the old Berlin charm alive. Julia Büttelmann, born in 1961 and master bookbinder, has her studio here. After various stays abroad and several involvements in exhibitions and awards, including the first prize in the Berlin regional competition for handicraft design, she has established herself here. And that's not by chance! This artist’s unusual work displays an evident affinity with the environment surrounding her domicile, part of the contrast between futurism and nostalgia.

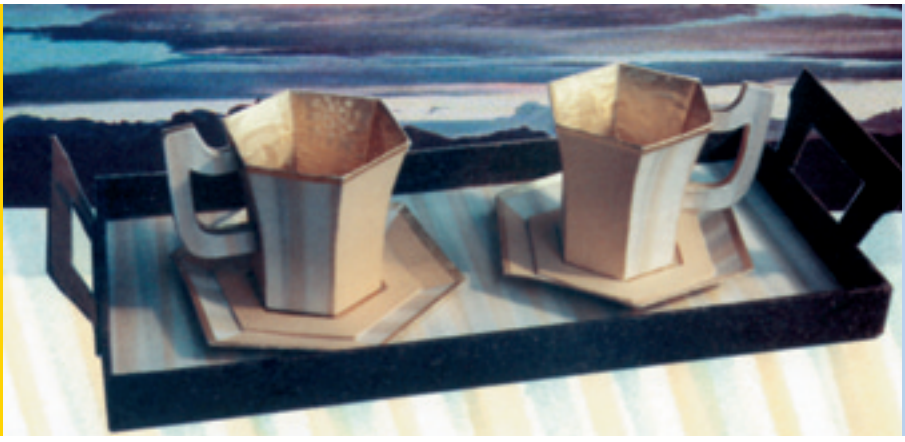

Fig. 1: *Shoe object 'Evita', 1996, shoe size 37, high-heeled sandals; pasteboard, printed paper, card and cardboard.*

Fig. 2: *'Collective Cups', 1998, object with two cups and tray; dyed paper, card and cardboard.*

Fig. 3: *'Heart-shaped Commode', 1997, height: 50 cm, with two drawers and tray; varnished paper and cardboard.*

Her small shop in Riemannstrasse is called "Papp-Show" ("Cardboard Show") and is a sales and exhibition room, design studio and workshop all rolled into one. From a pink-coloured staircase, visitors enter the basement, that area typical of almost all the buildings in the area originating from the Wilhelminian era. Generations of craftsmen, milliners and shoemakers, washerwomen and menders worked in these rooms, developing their creativity, their philosophy of life and their survival strategies here. It seems as if Julia Büttelmann's work possesses a little of the wit and the irony with which people here knew how to face up to the hardships of everyday life.

"Everybody knows them, the things of everyday life: a vase, a shoe, a chest of drawers or something else, and each of us has of picture of these objects in our mind's eye with very specific materials. Julia Büttelmann practises the art of redefining the contents as we have so far envisaged them. The artist cultivates the apparently banal material of cardboard by removing its conventionality. She amazes us with the unexpected in a most artistic manner. On the one hand, she continues the tradition of bookbinding with perfect workmanship; on the other hand, she goes beyond this and combines ideas and materials to arrive at scurrile but aesthetic forms of expression. Fantasy and irony are the sources of Julia Büttelmann's creative artwork.

The cup made of cardboard turns a utility item into an illustrative object, which opens up entirely new sight and touch perspectives. These works are real but surreal, and what additionally characterises them is the good humour they radiate," according to a fitting iconology by Ruth Mahr about the paper and card artist and the message her work conveys. And the newspaper "Berliner Zeitung" writes: "The name 'Papp-Show' says it all, because all of her objects designed in cardboard are small productions 'of a somewhat different taste'. At a first

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Fig. 4: *'Red Star' stool, 1997, height: 90 cm, width: 90 cm; paper, cardboard and leather.*

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glance, you admire the colourful and artistically created cardboard bags that are crocheted with shining chain-stitch bands. But if you take a closer look, you notice the coloured copy of a vulgar, spotty slice of ham sausage decorates the front of the small, delicate bag."

And what does the artist herself have to say about her work? – "My fascination for paper was aroused when, as a child, I received a blow-up Chinese ball made of paper. It had all the characteristics of paper that still fill me with enthusiasm today. It was light but none the

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Fig. 5: *'Bedside Table', 1997, height: 60 cm, width: 50 cm; varnished paper and cardboard.*

Fig. 6: *'Shoulder Bag', 1997, height: 28 cm, width: 30 cm; printed paper, card and leather.*

Fig. 7: *'Wristwatches', 1997; varnished paper and card.*

less durable – and it gave me a lot of pleasure. My ideas developed slowly. As a master bookbinder, I naturally make boxes and slipcases. These developed into small chests of drawers and bedside tables. Bags and jewellery followed later. I had the opportunity of making shoes for a year, thanks to a grant that meant I was able to discover new paper processing techniques for myself."

Whether her shoe creations could actually be worn? The answer is no. They are simply decorative objects. But which extravagant, truly fashionable shoes today are durable enough to be worn for any length of time? The amusing way in which she distances objects from their natural setting allows her to look at things in different ways, using new shapes and colours and giving them a beauty and transience in keeping with the constant changes of contemporary taste. Julia Büttelmann's works are durable. Her trained craftsmanship and her drive demand that of her work. Her extravagant boxes and small cabinets can be used to store all kinds of utensils, and her watches and bracelets can be worn as well. They are affordable, too, because their creator does not wish her work to be known only from exhibitions and museums but to be mainly in the hands of people who share her love of 'a somewhat different taste'.

A look at the 'Papp-Show' in Kreuzberg is most certainly worthwhile for visitors to Berlin who have a penchant for paper design – even if only to rediscover how infinitely diverse, exciting and positive working with paper and card can be.

Manfred Schindler