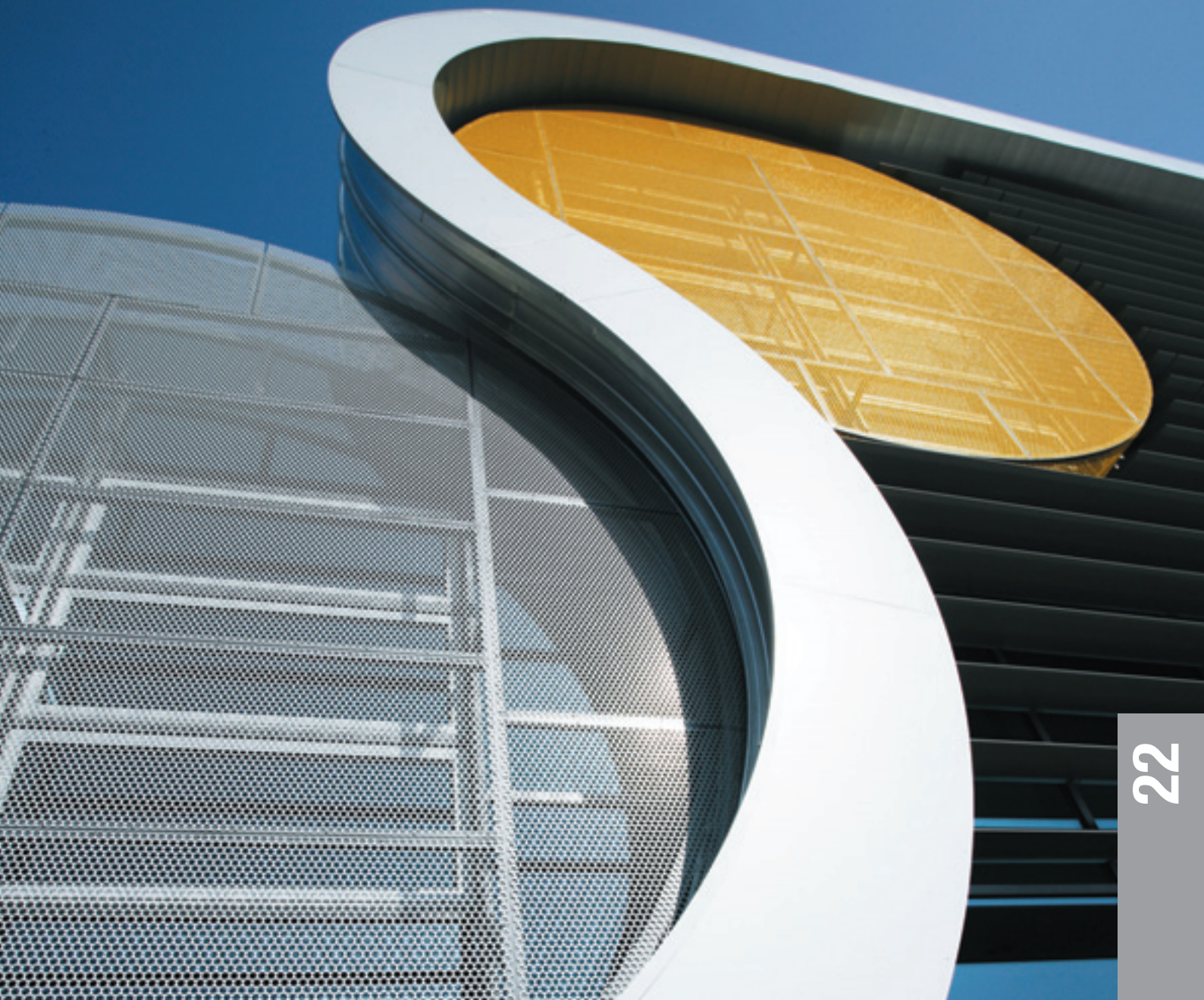
# twogether

Paper Technology Journal

## Paper Technology Center inauguration I Holmen Paper – 95 years of partnership I SAICA – new PM boosts capacity



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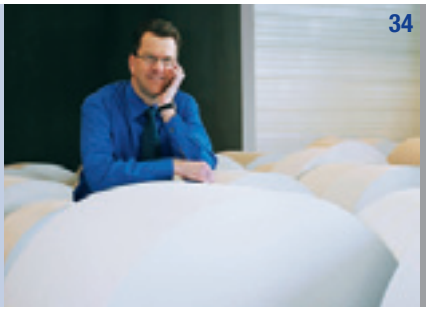



## Report



## Technology



Germany
Land of Ideas
Official Partner



## Miscellaneous



## Voith Group news



## Culture



## Regular features

*Dr. Hans-Peter Sollinger*
*Member of the Corporate Management Board Voith AG and President of Voith Paper*

# Key to the future

*Where would the world be without paper? Items such as magazine papers, newspapers, toilet paper, books, just to name a few, would be unthinkable without it. Paper production developed rapidly and constantly takes up new challenges. Just take a look at the development of machine speed and width. The fastest machines in the industry operate at nearly 2,000 meters per minute and are more than 10 meters wide!*

*Despite its dynamic growth, the paper industry has been suffering from unsatisfactory earnings and high cost pressure. Old and unprofitable production lines have to be shut down and up-to-date units have to cope with increasing production costs. Papermakers, and we also, know that the costs of operating must be reduced, but what is the key to make this happen?*

*The solution to this challenge is the key to the future for us. Both the capital costs and the operating costs of our customers must be lowered. We can achieve this by standardizing the entire production process and the modules. Standardization is the prerequisite to excellent start-up curves, expressed by increased tonnage.*

*To standardize both process and modules, we, Voith Paper, created the One Platform Concept as well as the completion and execution based on the Process Line Package. With capabilities such as these we are able to offer our customer a single-source solution, reducing interfaces thereby reducing risks and supporting our customer in consistently producing high-quality paper.*

*We give our customers the opportunity to streamline mill maintenance. Voith Industrial Services together with Voith Paper is here the competent partner, using all synergy effects and, therefore, stabilizing the production line efficiency on a high level.*

*Fiber and raw material costs are a major concern for papermakers as they represent a significant amount of the total cost. We have developed solutions such as fiber loading to reduce these costs.*

*The paper industry ranks among the five most energy-intensive branches. We, together with our Voith Paper divisions, are doing our part to develop solutions to reduce these costs.*

*To find the perfect key for all these concerns, we have to focus on innovations. This is exactly what we have done with the creation of our Paper Technology Center (PTC) in Heidenheim. Everything that has an influence on quality, process efficiency and paper quality in papermaking is here available for research.*

*For the first time, we can research the entire paper production process – from fiber to paper. Here, our customers will have the possibility of developing and experimenting with completely new machine concepts. This research center is the dream of every papermaker and opens so far unknown opportunities!*

*The Paper Technology Center is our key to the future. We have it in our hands, and we will use it for a more successful business of our customers!*

H. P. Sollinger

*on behalf of the Voith Paper Team*

# The new Voith Paper Technology Center opens its doors – Paper Valley celebrates


**Voith AG invested 75 million Euros in this future-oriented project. Why did the Heidenheim family firm spend more on a single project than ever before? The answer lies in a fundamental Voith philosophy: faith in innovation, strict alignment to customer needs and the independence of a family business.**


The new Voith Paper Technology Center (PTC) in Heidenheim was inaugurated on May 11, 2006 in the presence of about 700 international guests.

**“The Voith PTC breaks new ground in customer-oriented research and development.”**

The new PTC uniquely combines the research areas fiber system technology and papermaking process technology. “Ever since its founding in 1867, Voith has been an outstandingly future-oriented and research-driven company”, said Baden-Württemberg minister-president Günther Oettinger in his inauguration address.

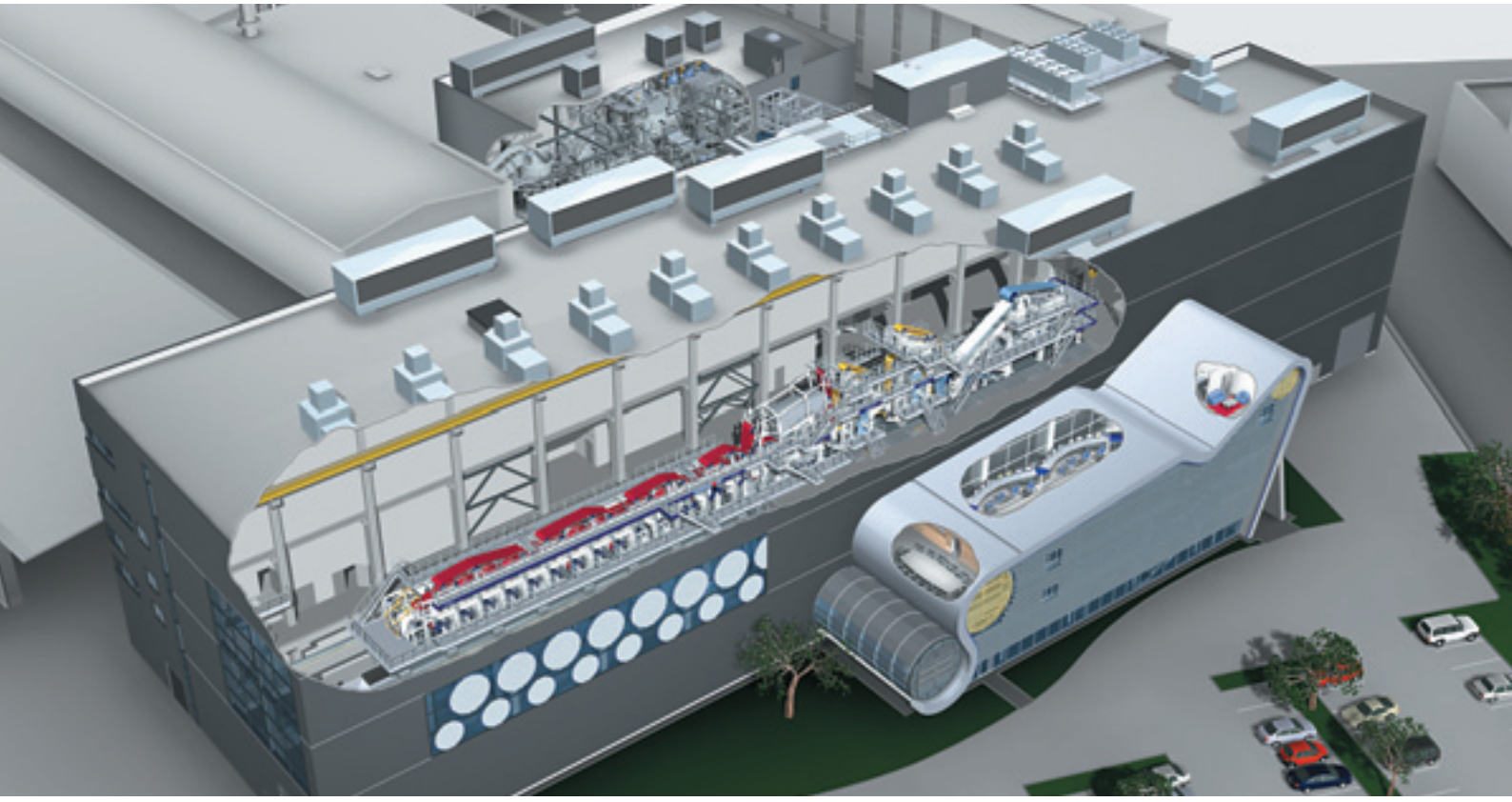
This new research center now enables for the first time comprehensive papermaking process testing and optimization under realistic conditions – ranging from stock preparation to machine configuration to end product, including automation systems and fabrics. “The Voith PTC breaks new ground in customer-oriented research and development. Research can be conducted here on everything affecting paper quality and the production process”, said Dr. Hermut Kormann, Chairman of the Board of Voith AG, in his inauguration address.

At the heart of the PTC is the 75 meter long PM 6 pilot paper machine. While the old test machine can only be run in start-up mode, this new one is designed for record performance levels at speeds up to 3,000 m/min (180 km/h!).

**“Now we can realistically test almost unlimited process alternatives, ranging all the way from stock preparation to print rolls.”**

Thanks to its modular arrangement, the new facility enables the testing and direct comparison of completely different and of course completely new production concepts. “Now we can realistically test almost unlimited process alternatives, ranging all the way from stock preparation to print rolls. That promotes innovation and gives our customers added security for their investment decision-making. The modular arrangement of the new facility cuts the needed time to about one tenth”, said Ulrich Begemann, managing director Voith Paper Technology Center GmbH.

*At the heart of this new Paper Technology Center is the 75 meter long PM 6 pilot paper machine. Inauguration on May 11, 2006 in the presence of minister-president Oettinger.*



*Overall view of the world's most modern paper technology research center.*

The various parts of the PM 6 test facility are stored in the so-called module station. Storage and retrieval are masterfully handed by lifting out entire machine groups and replacing them. The drying section is the largest and heaviest at 600 tonnes. It is supported on rollers, and automatically moved into the correct position according to press arrangement.

Until now it was not possible to influence stock characteristics in paper machine test facilities, but the new PM 6 is equipped with a "fiber design" system allowing precise adjustment of the stock characteristics to paper product requirements. The overall process optimization, possible here for the first time, is expected to lead to further innovations.

The equipment incorporated in PM 6 is also impressive: the latest DuoFormer TQv version, tandem NipcoFlex shoe press, and HiDryer. Apart from the length of the dryer section, this test machine corresponds exactly with a production machine layout except that it is only one meter wide as against modern production machine widths of up to 11 meters. This difference has no effect on the technological validity of test results.

Test operations are led jointly by papermakers, automation experts and paper engineers. Ideas can be developed, tested and realized here together with customers from all over the world. The test findings are used either as a basis for rebuilds on existing installations, or for new paper machines.

*Project manager Jörg Wilhelm has everything under control.*


*About 140 specialists work at the new PTC.*

The new Paper Technology Center is primarily intended for testing and implementing customized solutions. One way we do this is by integrating in the Paper Technology Center reputed companies such as BASF, Omya, Siemens and Cargill who work with Voith here on common research projects.

**“Here we shall make things possible that have only been dreamed of so far.”**

The Heidenheim research center in its futuristic new building, therefore, has a clear assignment: to promote paper industry profitability and productivity worldwide through innovations and systematic process optimization. Or as enthusiastically formulated by Dr. Hans-Peter Sollinger: “The new Paper Technology Center lets us play an even greater role in technological and quality leadership. Here we shall make things possible that have only been dreamed of so far”.

Architecturally, the new Paper Technology Center comprises three building tracts: the actual paper machine hall, the office building largely adjoining it, and the stock preparation zone. The machine hall is of course the most impressive feature of all: 115 m long, 42 m wide overall, and up to 28 m high.

Constructing the new PTC required 900 tonnes of reinforcing steel, 9,800 cubic metres of concrete, and nearly 1,400 prefabricated concrete sections – about the same as would be needed for building 150 houses!

The architectural highlight is clearly the office complex. Designed to harmonize with papermaking themes, it emanates the lines of a paper machine wet end. It also houses the control room, as well as conference rooms and lounges for customers. Several laboratories are incorporated for assessing stock samples, finished paper, and printing results.

Heidenheim was chosen as PTC location due not only to the immediate vicinity of existing research and development facilities but also to the importance of continuous contact with other departments such as design and marketing. Our entrepreneurial foresight has paid off: the new Paper Technology Center – exemplifying record-breaking performance, future orientation and vision – was chosen as one of the 365 locations nationwide promoting “Germany – the Land of Ideas”. This unique technology center not only enhances the image of Heidenheim as Voith headquarters, but also turns it into a paper research center par excellence – some people are already calling this Ostalb location “Paper Valley”!

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**Günther H. Oettinger**
**Minister-President**
**Baden-Württemberg**

I heartily congratulate Voith AG and all its people on the inauguration of Heidenheim's new Paper Technology Research Center, which sets a milestone in global leadership. By investing about 75 million Euros in this project, you have once again shown the decisive entrepreneurial commitment traditionally characterizing Voith as a venerable family business.

This exemplary company stands for the values and quality dedication that have brought Baden-Württemberg to the forefront in our Land of Ideas, as shown by the 400 patents annually registered by Voith. Baden-Württemberg's leadership lies in the commitment of companies like Voith AG to superiority on the global market. And the new PTC, internationally acclaimed in expert circles, will ensure that we uphold our lead in industrial performance, research and development.

**Dr. Hermut Kormann**
**Chairman of the Board of Voith AG**

Today is a big day not only for Voith but also for Heidenheim and the entire East-Württemberg region. With the inauguration of Voith's Paper Technology Center, the heart of Paper Valley starts to beat. For this is where the paper of the future will be developed; this is where new frontiers will be crossed in paper machine technology. The future innovations born in Paper Valley will be acclaimed by papermakers worldwide.

I am delighted that we have so quickly realized this epoch-making project right here in Heidenheim, where Voith has always been at home. And I strongly believe in the power of innovation: Voith has written technological history time and again in our long tradition as an independent family company. The new Paper Technology Center will play a decisive role in assuring not only the future of Voith but also the future of our customers.

**Dr. Hans-Peter Sollinger**
**President of Voith Paper**

Now we have it: the key to the future. Today is the beginning of a new era in paper technology research. The new Paper Technology Center is a dream come true for every papermaker, and for us it opens new frontiers. Here we can show our customers the future already today. And for the first time, our paper technology research can delve into every detail of the entire papermaking process.

This globally unique paper technology research center is well timed for Voith. It allows us to tackle the challenges of the paper industry with developments to further improve papermaking cost-effectiveness by saving energy, reducing water consumption and making more efficient use of fibers. It will also enable paper quality improvements with still greater benefits both for end users and finishing plants. The demands of our customers today for new and better papermaking solutions are higher than ever before.This Paper Technology Center will help us to meet those demands in our role as pathfinder for the paper industry.

# Voith Paper Technology Center – A vision becomes reality

**Interview with Ulrich Begemann, Managing Director Voith Paper Technology Center GmbH**

**twogether:** How was the PTC idea born?

**Begemann:** Our customers' requirements have changed a lot over the last few years; to book orders today, we have to offer an overall concept meeting their needs in full. Cost-effectiveness, productivity and high quality play a key role thereby.

And this naturally makes higher demands on our research capabilities. To assess the overall effect of innovations, we must reproduce the papermaking process as realistically as possible right from stock preparation to paper finishing. This has not been possible anywhere in the world until now. Voith saw in good time the opportunities opened up by these market charges and energetically realized the PTC vision with creative enthusiasm.

**twogether:** How long ago was that?

**Begemann:** We first had the PTC idea in 1999.

**twogether:** Why did you finally decide on Heidenheim as a location?

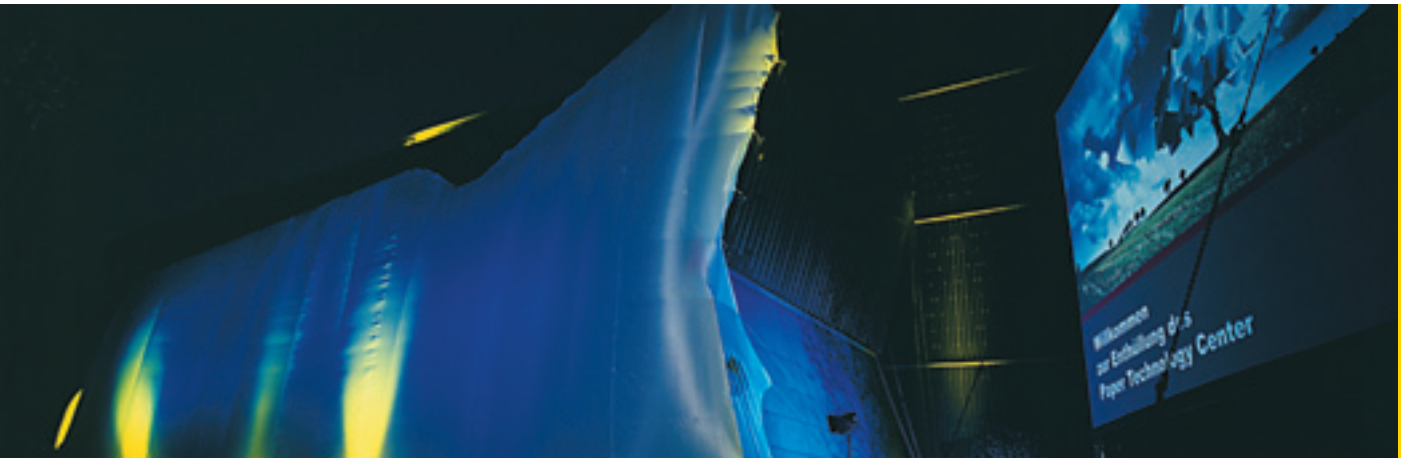
**Begemann:** To succeed in our business, we must respond to market needs immediately. For this our R&D people have to be in continuous contact not only with customers but also with their design and marketing colleagues among many other departments. And all of them are in Heidenheim. Another point is that not everyone likes changing workplaces, and we might have lost some good people if that had been necessary.

**twogether:** How will Heidenheim benefit from the new R&D center?

**Begemann:** Big research institutes work today in networks, and this often attracts new businesses. The transfer of Voith Paper Fabrics R&D from Pfullingen to Heidenheim is a typical example. As another benefit, this also safeguards jobs in Heidenheim, where the Voith Paper Technology Center GmbH employs about 140 people.

**twogether:** Why is the Heidenheim region called "Paper Valley"?

**Begemann:** Because here we have the world's best paper industry



research center by far. For the first time we can now conduct full-scale tests on the entire papermaking process, integrating all its key disciplines because Voith Paper Fabrics works here with our cooperation partners BASF, Siemens, OMYA and Cargill.

**twogether:** How do you work with these four cooperation partners in the new PTC?

**Begemann:** On the one hand they are free to carry out their own tests here, and on the other hand we shall work together on joint projects such as investigating the effects of chemical additives on the papermaking process.

**twogether:** How will Voith's partners benefit from the new PTC?

**Begemann:** Our partners have a state-of-the-art paper machine test facility at their disposal. Thanks to this and through cooperation with us and Voith customers, they benefit from a deeper insight into the entire papermaking process.

**twogether:** What problems did you have to tackle while realizing this project?

**Begemann:** Since this is a paper technology research center, not much of the project was standard practice, and a good many solutions had to be worked out as we went along. For us these were more of an exciting challenge than problems, however.

**twogether:** What motivated you to carry on when things got tough, as they certainly did sometimes?

**Begemann:** We knew right from the beginning that putting our PTC vision into practice was the right decision – in fact the only way to stay abreast of market needs. It was really fantastic to see the dream coming true before our eyes, and that's what kept us going through all the weeks and months of hard labour.

**twogether:** In what respects was your PTC project team so outstanding?

**Begemann:** Enthusiasm for an unusual project, fast decision-making, the ability to plan untrodden paths in detail, and an excellent team spirit at all times, even under time stress.

**twogether:** What are you particularly proud of in this project? What is your personal highlight?

**Begemann:** Actually there are two highlights. One of them is the combination of our new PM 6 test machine with a "fiber design" facility. This enables customers for the first time to vary their stock characteristics and see the effects on the finished paper straight away. The other highlight is the modularity of the PM 6 test facility, which enables entire paper machine sections to be exchanged in a very short time. That gives our customers the possibility of developing and testing completely new machine concepts.

**twogether:** Did you have any ideas that could not be put into practice yet?

**Begemann:** No, we managed to reach all our goals so far. The next thing will be to put our customers' ideas into practice here.

**twogether:** Building the new PTC was Voith's biggest investment to date. How will it pay off?

**Begemann:** To continue with organic growth as planned, Voith needs to develop innovations benefiting our customers significantly. Such innovations generally consist of completely new products and processes, and we need the PTC to prove to our customers that they work.

**twogether:** You have taken the first step by opening the new PTC. What will you do with it now?

**Begemann:** We now will focus more on our R&D work, and shall work hard on making everything run smoothly in the PTC. That is quite a challenge, rather like running a paper mill.

**twogether:** How will Voith customers profit from the PTC?

**Begemann:** All papermakers have goals for perfecting their production processes and products, and naturally for getting the most out of their raw materials. Now for the first time in the history of papermaking, our customers can test under realistic conditions production processes that are completely different to their own.

They get results rapidly and can take them home with them.

**twogether:** What do you think Johann Matthäus Voith would have thought of the new PTC?

**Begemann:** I'm sure he would be delighted to see that Voith still finds innovations so important and perhaps even more decisive: that we are still investing in innovation. Because all those years ago, his strategy was to stay ahead through a creative and open attitude to innovation. It was not by chance that he was called the "inventor from the Swabian Jura".

**twogether:** How would you summarize the new R&D center in only three words?

**Begemann:** Innovation, realness, customer-benefit.

**twogether:** How do you visualize the future of the PTC?

**Begemann:** As a place where our customers enthusiastically put their visions into practice with Voith. And I am sure that will soon be the case.

*The spectacular unveiling of the new Paper Technology Center on the evening of May 10, 2006.*


# Partnership is the key to success

## International Customer Conference on Graphic Papers

**This year's Voith Paper customer conference in Ulm Congress Center, entitled "Life Cycle Partnership", was attended by more than 550 guests from all over the world. The expert discussions of topical themes at this first-class conference soon showed very clearly that for sustainable success in today's tough global market, trusty partnership between paper machine suppliers and papermakers is indispensable.**

*The symposium was expertly moderated by Alexander Wassermann, Senior Vice President Sales and Marketing Paper Machines Graphic.*

## Trade press conference
**Tuesday May 9, 2006**

At the international press dialogue, meanwhile established as a traditional kick-off to these conferences, Voith Paper's exciting new developments were released to the public. Voith Paper president Dr. Hans-Peter Sollinger and members of the corporate management discussed the Life Cycle Partnership principle with reporters, and revealed some secrets of our latest innovations. Interest was principally focused of course on the imminent opening of our new Paper Technology Center (PTC).

## Get-together evening
**Tuesday May 9, 2006**

After very long journeys in some cases, the 550 invited guests representing 189 companies in 31 countries on four continents were heartily welcomed on the first evening at an informal get-together. Greeted by Kurt Brandauer, Executive Vice President Graphic Paper Machines, and Bertram Staudenmaier, Member of the Corporate Management Board and Executive Vice President of Voith Paper, everyone gathered for a cocktail reception with dinner buffet.

While savouring international cuisine and wines in this relaxed atmosphere, some lively discussions ensued both between old business friends and new acquaintances. It must be very seldom that so many key representatives of the paper industry worldwide have such an opportunity to meet together.

## Conference sessions: Life Cycle Partnership
**Wednesday May 10, 2006**

Punctually at 9 a.m. all 550 participants met again at the congress center for the official welcome and overview. They were presented with a systematic concept of presentations centering around the interests of Voith customers themselves: each session was focused on upholding their sustainable success in today's fast-moving paper markets.

The conference schedule was well designed to hold their attention, by dividing the Life Cycle Partnership concept into four paper machine related phases: Grow – Improve – Reposition – Sustain.

Our slogan "Voith Paper – a perfect partner at any time" aptly illuminates the concept of Life Cycle Partnership, which is indispensable for optimal customer support in all markets. Such partnership with the supplier enables mutual identification of the most profitable solution for the customer in all phases of the paper production line life cycle.

*Trade press dialogue with the Voith Paper Board and management members.*

Prior to the four phases we added another one: “Consult” – because success already depends on sorting out the best ideas before starting on project development. And Voith Paper as a truly experienced partner is invaluable at this stage.

The presentations given by our customers authentically confirmed that Voith Paper is certainly following the right strategy with Life Cycle Partnership. Some customers joined Voith speakers on the platform to explain how well their partnership with Voith Paper had paid off in their various projects. During question time afterwards, our guests received clear answers from Voith Paper experts on many interesting points. The entire conference was moderated extremely capably and in an entertaining manner by Alexander Wassermann, Senior Vice President Sales and Marketing Paper Machines.

Later on in the afternoon, our enthusiastic audience were shown Voith Paper’s vision of the future. Ulrich Begemann, Managing Director Voith Paper Technology Center, explained the future challenges facing the paper industry, and how Voith Paper is already teaming up with customers and strategic partners to work out appropriate solutions.

Dr. Hans-Peter Sollinger vividly demonstrated in his presentation how Voith Paper will put the key to the future in customers’ hands. Further to the now familiar One Platform Concept – modular overall solutions for all papermaking processes and for all grades – Voith Paper now takes another big step into the future with customers. “And the key to the future is our strength to be innovative”, summed up Dr. Sollinger as an introduction to the new Paper Technology Center.

Indeed, the new PTC opens up unlimited possibilities for Voith Paper customers to turn our common visions into reality (see page 4).

With this vision statement, the proceedings concluded to resounding applause and with high spirits in anticipation of the gala evening to follow.

## Spectacular gala evening in the Donauhalle, with live video transmission from Heidenheim

This gala evening in the festively decked auditorium was staged as a spectacular journey through the various epochs of papermaking history. The technological milestones marked in this impressive show were accompanied down the ages by gourmet delights from China, Japan, the Arabian-Moorish world and Spain, including Gutenberg’s times and the industrial revolution. Star of the show at all times was of course paper itself.

At 10 p.m. the excitement rose to fever pitch when our host in Ulm, Dr. Sollinger, interrupted this journey through time by returning to the here-and-now. He invited the gala audience of more than 650 guests to take a trip into the future of papermaking: to Heidenheim in Paper Valley – just in time to witness “live in Heidenheim” the PTC unveiling ceremony. Dr. Hermut Kormann, Chairman of the Board of Voith AG, was conjured on screen in Ulm by video link, together with Ulrich Begemann,

*Question time in the Ulm congress center auditorium.*

*Dances from the Arabian-Moorish epoch.*

*Grand finale at the gala evening: the "Paper Diary Song".*

Managing Director Voith Paper Technology Center, and 1,200 jubilant Voith people with guests against the background of the veiled PTC.

Amid outbreaks of spontaneous applause in Heidenheim and Ulm, all our guests in both places were able to witness the spectacular unveiling. A particular highlight of this event was the specially composed "Paper Diary Song", poetically telling the story of paper and its importance for mankind and our cultural future around the globe.

"Today is a big day for Voith and Heidenheim: we are witnessing the birth of Paper Valley. And through Paper Valley a veritable flood of innovations will soon be flowing!". With these historic words Dr. Hermut Kormann summarized the epoch-making significance of the new Paper Technology Center.

A large PTC key was then handed over symbolically to Dr. Kormann as "Key to the Future". And that was the end of the show in Heidenheim – but in Ulm we all sat back to enjoy our gala dessert...

...until another surprise at 11 p.m. when Dr. Kormann and Ulrich Begemann suddenly appeared on

*Chinese acrobatics from the birth of papermaking.*

stage to greet us all in person. Then followed the culminating highlight of the evening: Dr. Kormann handed over his “Key to the Future” to Dr. Sollinger, who proudly held it aloft and announced “Here it is everyone! We have it!”. After this moving “key scene”, Dr. Hans-Peter Sollinger passed on the key to Ulrich Begemann – now in charge of PTC operations – ready for opening the doors next day to an inaugural tour by our guests.

In this way “The Key to the Future” was symbolically handed over to our customers; for it is they, who in partnership with Voith will make the new PTC a center of innovation meeting the future needs of the entire paper industry.

It goes without saying that after enjoying such a successful symposium and exciting gala evening, our guests retired in eager anticipation of the Paper Technology Center inauguration and tour on the following day.

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*The paper quality is not only confirmed by a visual control, but also by the printers' judgement: It's first-class!*

# Stora Enso Kabel OLC 5 – Quality creates satisfaction

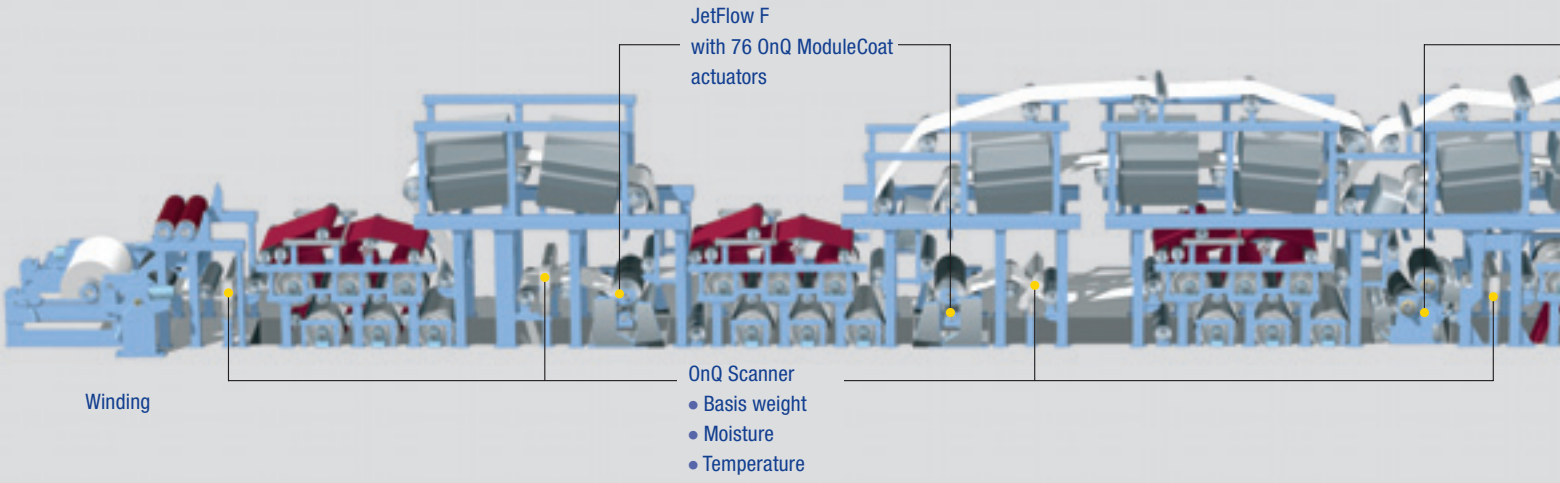
**The Stora Enso mill Kabel is one of the most modern and efficient production sites of the Stora Enso Group. This was accomplished by a consistent development of the OLC 5.**

The start-up of the offline coater was in 1980. The quality measurement system was replaced for the first time in 1988. In order to increase the operating speed and to improve the runnability, the applicator roll coaters with blades were changed in pairs step by step. In fall 1999, the two pre-coaters were equipped with Voith SpeedCoaters for one-sided coating.

In 2001, the OLC 5 applicator roll coaters for top coating were extended by two JetFlows, which were delivered by Voith as well.

## Market requirements and existing old technology forced modernization

In 2005 Stora Enso intended to equip its Hagen Kabel mill with a new quality control system because their existing system was outdated. At that time the CD profile control has been done manually. Beside that techno-




*Coating concept OLC 5*

logical aspect the modernization was also the response to an increasing market volume for rotogravure printing and a trend to wider rolls. At the PM 5 and the SM 5, high quality coated wood-containing paper for offset and rotogravure as well as coated cut-size offset is produced. It is mainly used for magazines, catalogues, flyers and advertisements, but also for school books, calendars and business reports.

With the new quality control system, Stora Enso intends to meet the market challenges and to improve its competitiveness.

## OnQuality fulfilled Stora Enso's high demands

Stora Enso was looking for an automation partner who was able to fulfill the following project requirements:

- state-of-the-art sensor technology
- a convincing control strategy
- a reliable design of frames and actuators
- and best cost-efficiency ratio.

Additionally, Stora Enso requested that the new system will perfectly fit into the existing coating concept. Furthermore, they set value on a continuous service support by high-class experts over the whole life span of the quality control system. In all these mentioned points the concept of Voith Paper for the modernization of the OLC 5 convinced management, papermakers as well as C&I engineers of Stora Enso.

## Systematic approach for excellent results

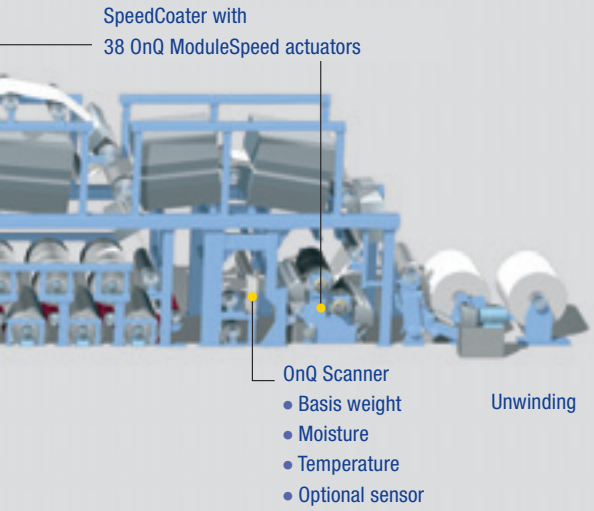
To get a deep insight Voith specialists analysed first of all the whole process. By using a Fourier analysis of the CD-profiles the ideal actuator width was determined and the expected CD-profile deduced. This was the basis for Voith to guarantee Stora Enso specific 2-sigma values. Additionally, a simulation of the start-up curve of the OLC 5 was done to predict the settling time. Based on this analysis, the concepts for the MD-controls were configured as well.

Because different applicators are installed in the OLC 5 with the SpeedCoater for primary coating and the JetFlow F BladeCoater for the top coat, the mechanical effects of the applicators were included together with the theoretical analysis in the specification of the ideal actuator width.

## "Perfect fit" solution

The result was a custom-made OnQ application solution for the OLC 5, focussing on the specific customer requirements with a clear defined ROI by means of a quality improvement.

The two SpeedCoaters for pre-coating were equipped with the OnQ ModuleSpeed system with 38 actuators each (200 mm actuator width) whereas both of the JetFlow F blade coaters were retrofitted with the OnQ ModuleCoat system with 76 actuators (100 mm actuator width). The preceding evaluation showed that in this case a shorter actuator width with 75 mm would only have led to a




marginal profile improvement. Both actuator systems are controlled by the well proven Profilmatic control software. The quality control concept was topped by the coordinated speed change control and a special start-up control for the OLC 5.

Furthermore, the existing scanners were replaced by five new OnQ Scanners. The sealed scanner structure and air purge help stabilize the beam temperature to prevent contaminants from entering the mechanical and electronic components. The high accuracy at the OLC 5 is further enhanced with flushing the sensors with compressed air.

The first OnQ Scanner was installed directly after the unwind. It measures basis weight, moisture and temperature of the base paper and offers optional space for an additional sensor. The other four OnQ scanners are placed after the coaters and the subsequent dryer section respectively. They are each equipped with a basis weight sensor based on krypton, an

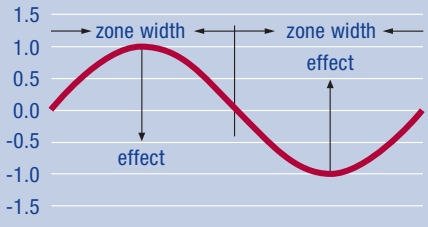
## FFT analysis of coat weight CD profiles

The frequency analysis of the coat weight profiles breaks down the measured, typical coat weight CD profiles into the intrinsic harmonic fluctuations and determines their proportions in the overall profile. An optimum actuator width can be determined according to the frequencies occurring in the CD profiles. The phase shift between the operating points of the actuators and the sinusoidal fluctuations is important to the effect of the actuators.

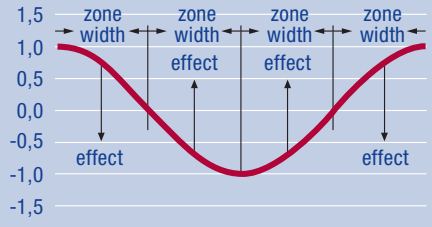
Presuming that the phase shifts of all profile fluctuations are evenly distributed, three times the actuator width can be used as an average to calculate the minimum controllable frequency.

The initial measured profile and the number of databoxes are decisive for determination of the theoretical potential for improvement. At least 3 databoxes should be measured for each actuator width. Furthermore, the chosen actuator width determines the possible improvements.

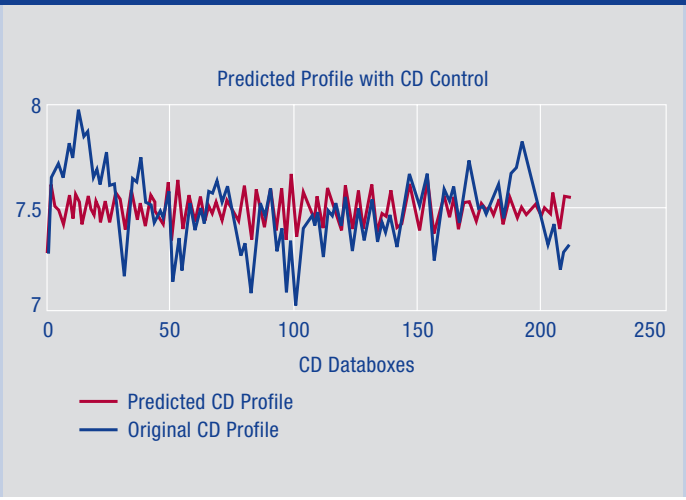
Regarding the overall variance in the paper, this is composed of the CD profile fluctuations, the MD fluctuations and a remaining fluctuation. The remaining fluctuation includes all high frequencies, which cannot be regulated by CD or MD control. In a profile with a large number of databoxes, the proportion of the remaining fluctuations is higher than in a profile with a low number of databoxes. The reason for this is that a low number of databoxes acts as a data filter. A high number of databoxes reveals high-frequency fluctuations in the analysis. The number of databoxes is a decisive factor in the examination of the potential improvement percentage. For this reason, it is appropriate to relate the potential improvements for all considerations to a previously defined number of databoxes and number of actuators.




*Phase equivalence between the operating point of the actuators and the sinusoidal fluctuation: Only 2 actuator widths are required to compensate the frequency.*




*90° phase shift: 4 actuator widths are required to compensate the frequency.*




*Predicted CD profile to determine the room for improvement at the OLC 5.*


*The OnQ Scanners incorporate sturdy box-frame construction that provides inherent dimensional stability.*

infrared transmission moisture sensor as well as a temperature sensor. All sensors use CAN Bus technology for high-resolution measurements.

The basis weight sensor with Krypton source is based on solid-state silicon technology. Its high signal-to-noise ratio allows fast, precise profile measurements. Furthermore it allows web flutter detection as the measurement cone gets larger when the web moves towards the transmitter.
A x-y-z measurement compensation is possible as well.

DynaComp dynamic standardization compensates for dirt accumulation at the end of each traversing (typically after every second traversing). Thereby, the standardization cycle can be retarded up to 12 hours and the measuring carriage is outside the web for a shorter time.

The infrared moisture measurement is a fast and precise same-spot measurement with four channels for direct moisture and fibre weight measurement. The used technology allows a direct moisture measurement without a separate basis weight sensor compensation. The simultaneous measurement of all four channels is done by beam split techniques.

The OnQ Quality Control System is supplemented by a control package, which is especially aligned to the needs of the Kabel mill. The combination of coating unit, Profilmatic control software and dedicated actuator system of the OnQ ModuleSpeed and the OnQ ModuleCoat respectively ensures that the high requirements regarding the paper quality can be fulfilled.

The OnQ ModuleSpeed actuator is the centerpiece of the SpeedCoater while the OnQ ModuleCoat is designed for blade coaters and is equipped with a second direct position measurement in addition to the encoder.

The additional position response via LVDT (linear variable differential transformer) provides absolute safety to protect the profile ledge.

The automapping algorithm of the Profilmatic control software continuously aligns the measured data of the profile with the respective actuator position. This ensures uniform coating. The “mapping model” adapts to the measured modification.

## First-class results at all four coaters

The improvements after the installation of the new quality control system at the OLC 5 are really significant. The reduction of the 2-sigma variations is even better than predicted. The primary improvement appeared at the coating profiles which resulted in better moisture CD profiles as well.

Furthermore the settling times of the OLC 5 after a sheet break are nowadays a lot shorter as before the installation as the modern OnQ Quality Control System enables flat profiles within ten minutes after start-up. By improving the paper quality in this way, the Stora Enso mill Kabel was able to significantly improve the customers’ satisfaction due to:

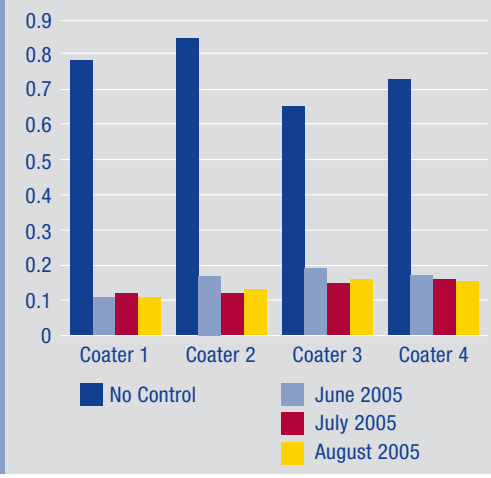
**2-9-2005**
End of installation

**2-10-2005**
**11:15 am**
Starting up with the same functions as the older system

**2-10-2005**
**5:40 pm**
Scanning with coated paper

**2-11-2005**
**7:00 am**
Saleable paper and start of optimisation phase

*After finishing the assembly phase the whole project was realized within only three days.*




*Comparison of the monthly average values of the 2-sigma profile fluctuations of the coat weight from the parent roll reports (three months prior and after the installation).*

- fewer coating defects
- better gloss profile
- improved flatness
- uniform moisture content
- better printability.

The Stora Enso example shows that a modernization of the QCS means much more than just to keep a plant alive. For Stora Enso Hagen Kabel the realization of this project is another step to consolidate and even to extend their market position.

## Customer benefits from teamwork of the Voith Paper divisions

The assessment of the project also reveals the strength of Voith Paper: the combination of the knowledge of Voith Paper technicians regarding the coating process with automation know-how permitted a “perfect fit” solution to be implemented and the project to be completed with secured funding and deadlines for Stora Enso.

The paper technicians were involved from the beginning of the project with the described process analyses in the calculation of the ROI and the quality parameters as well as in the assessment of the results. It was also possible to achieve an optimum adjustment of the mechanical components of the CD profile actuators of the OLC 5, so that the installation of the control unit could be conducted as a complete unit on the existing coater beams.

The entire scope of supply for the OLC 5 with measuring frames, associated sensors, MD controls, actuators, Profilmatic CD profile control software and the subsequent service were provided exclusively by Voith Paper. The advantage for the customer was to have a competent automation partner at all times, in all matters regarding the project and without go-betweens.

To ensure that the results remain as perfect as they are now, specialists from Voith Paper will support the service and maintenance team on site for the entire life cycle of the machine.

### Customer Comment

**Andreas Genz**
Managing Director
Stora Enso Hagen Kabel

“We deliver high quality coated wood-containing paper for offset and rotogravure as well as coated cut-size offset. With the new OnQ Quality Control System by Voith Paper we had a significant improvement of the paper quality. Our customers are highly satisfied today because the quality constancy, the surface properties as well as the printability of the paper fulfills highest demands.”

### Contact

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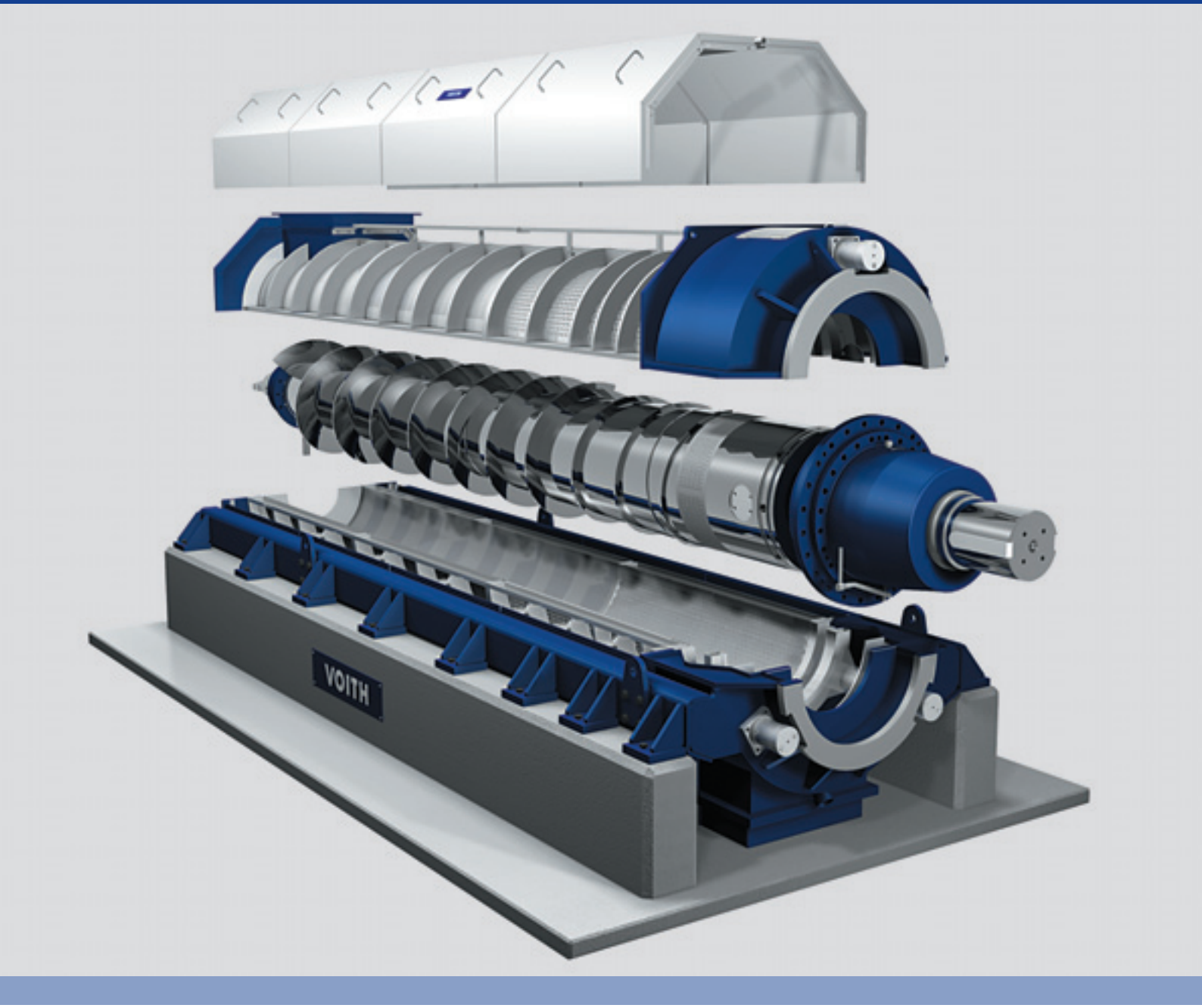



# Thune screw presses for sludge – the innovative screw press design for high dry contents

**In almost every pulp and paper mill sludge is generated and has to be taken care of. Squeezing out as much liquid as possible before final disposal is of utmost importance in order to fulfil environmental legislation within economically reasonable limits. Voith now has an advanced screw press specially designed for sludge dewatering in its product portfolio.**

## New revolutionary design

On starting design work for the Thune screw press for sludge some fundamental criteria were obvious. The machine must be sufficiently robust and stable to withstand the high torques generated when squeezing out the maximum amount of liquid from sludge. Operation must be easy and reliable. Bearing in mind the high wear often seen in sludge applications, easy maintenance is also a crucial factor. And to be competitive, the cost per ton of sludge treated must be acceptable for the customer.

To comply with these basic criteria, some secondary criteria also needed to be defined. Total weight of the sludge presses must be similar to or lower than the same size Thune pulp presses. And the dewatering per screen area must be higher than for comparable sludge presses on the market.

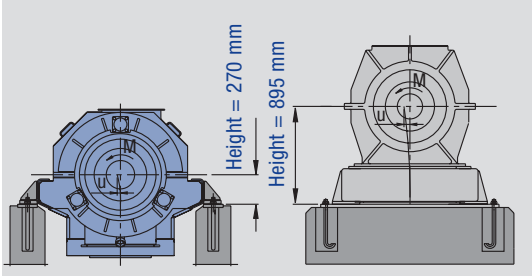
In the new design, the forces generated when squeezing to maximum dryness are distributed much more evenly over the machine length than is the case with conventional screw presses. This is achieved by integrating the discharge housing, inlet section and screen supports into the machine frame. In addition, the centreline of the complete screw press has been lowered to minimize machine height above the foundations. The result is a very robust and stable machine with minimum deflection, even at the highest torques.

### Thune screw press for sludge

- Screw press centerline is close to the foundations for minimizing deflection
- Main components are integrated into the machine frame for even distribution of forces and for a very robust and stable machine
- Robust bearing arrangement enables reverse operation at full load

With 80 years of accumulated experience in designing screw presses the Thune design engineers have, of course, also designed a very service-friendly machine and built in sound, proven technology such as the Wear-Less segments.

*Thune screw press for sludge.*

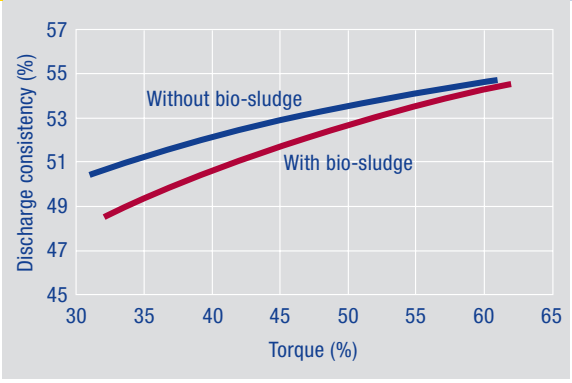




*The Thune screw press for sludge (on the left) compared with a standard screw press.*

*With the new Thune design for sludge, the height of the press above the foundations has been radically reduced.*

*Voith product manager Lars Smedsrud with his new baby at Adolf Jass, Schwarza, Germany.*




*Discharge consistency in the Thune sludge press obtained at different torque settings.*

## Customer Comment

**Håkan Ohlsson**
Production Manager,
Örebro Kartong,
Sweden

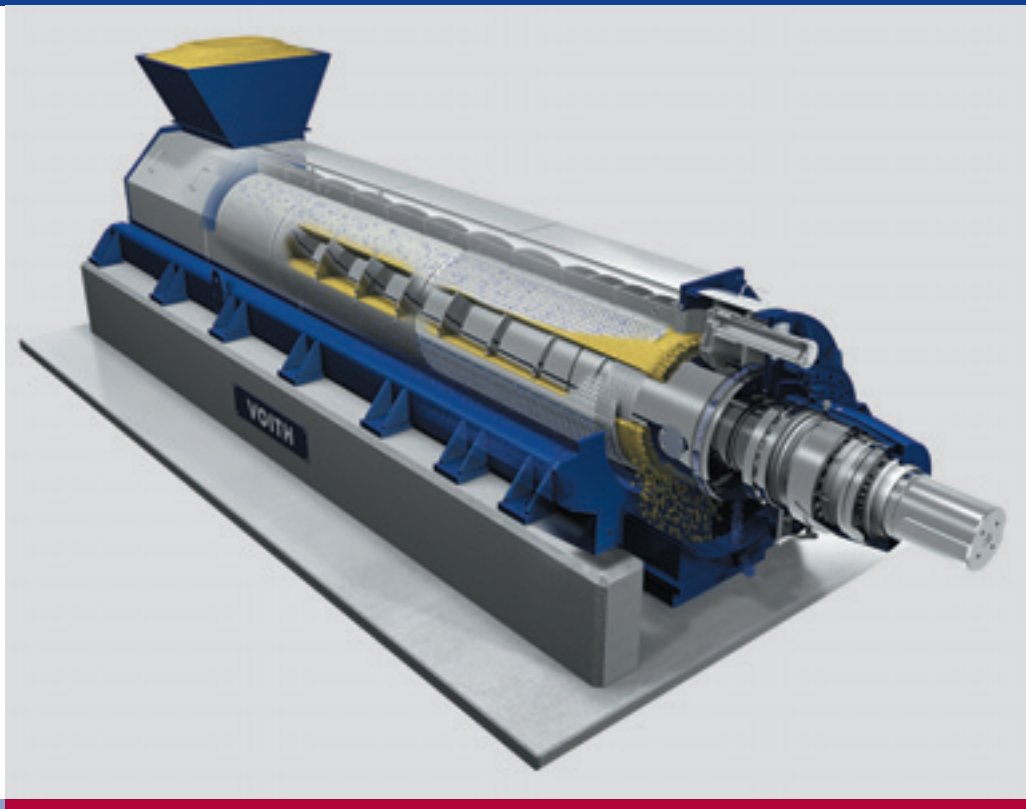
"When we needed to replace our old wire press we entrusted Voith Paper in Norway to supply the new sludge dewatering system. From the very first project meetings we have had only positive experience with the service and the Voith people involved. Even with sludge tonnages considerably above the guaranteed values we have stable operation and only minimum attention is required. With the service agreement recently signed with Voith Paper we expect the system to continue its successful operation for years to come."

### First installation of an SPS70 screw press for sludge

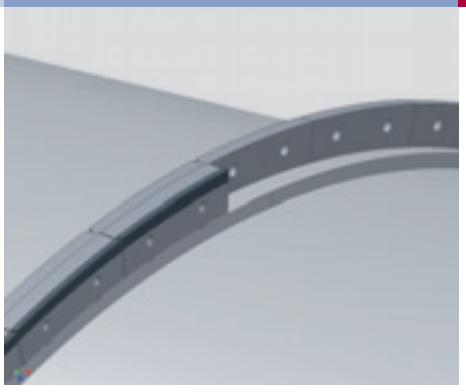
In February 2005 the first Thune screw press for sludge started up at the Adolf Jass Schwarza mill near Rudolstadt in Germany. This greenfield mill, for which Voith delivered the entire process technology from stock preparation to winder, produces fluting and testliner from 100% recovered paper. Since start-up, the SPS70 sludge press has been in continuous operation and after only two months it was already operating better than the expected values. All fine rejects and sludges in the mill are fed to the Thune sludge press for final mechanical dewatering. Fine screen rejects, DAF rejects and bio-sludge, are fed via a Meri BlueDrain gravity table to the Thune sludge press. Cleaner rejects and pre-screened sewer material are sent to the Thune sludge press after pre-dewatering in a Meri Sediphant.

*WearLess segments are mounted on the last screw flight at the discharge end of the screw press.*

*Different wear-resistant materials are used, based on the application requirements. Replacing a worn segment with a new one takes only a few minutes and with the bolt-on solution the segments are always exactly positioned.*




*Material flow.*



Variations in feed to the sludge press are handled by an integrated torque control system. In this way a constant discharge consistency is obtained for varying sludge flows and different sludge compositions.

Voith Paper's headquarters for dewatering technology in Tranby, Norway would like to express thanks to all the people involved at Adolf Jass Schwarza for their support and assistance in helping to make this a success story. There is always a certain risk when agreeing to include a prototype in a project, but without confidence in a new product winners are not made!

## System supply capability

The dewatering group at Tranby supplies screw presses for sludge not only for large projects. The group also has the capability to take on smaller system supplies in the sludge dewatering business. One such example is the system delivery to Örebro Kartong in Sweden (see Customer Comment on page 26) where a system consisting of a Meri Elephant filter and a Thune screw press were the main components. The delivery included all necessary pumps, valves, instrumentation, piping, foundations etc. as well as local PLC for control of the system, making it a complete supply package. The system, which replaced an old wire press, has now been running smoothly for more than two years.

### Contact

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*Exchanging the refiner fillings of a TwinFlo TF1D double disc refiner.*

# Voith Paper Vaassen – Wear-proofing for rotors and more...

**In view of the considerable cost pressures facing the paper industry, it is increasingly important to reduce life cycle costs. The Voith Paper Fiber Systems Division responsible for stock preparation not only offers highly efficient machines for optimal fiber yield with minimal fiber losses and energy costs. The Division also offers extensive services to help papermakers reduce their stock preparation costs without sacrificing machine efficiency.**

*Robot welding technology for repairing rotors.*

Over the last fifteen years Voith Paper B.V., Vaassen, Holland has accumulated extensive know-how in refurbishing pulper and flat screen rotors. This small, efficient and customer-oriented subsidiary of Voith Paper Fiber Systems GmbH now manufactures and overhauls more than 400 rotors every year. In the meantime, Vaassen's specialized know-how is available practically throughout the Voith organization, so that customers have this wide range of services available to them worldwide.

## Rotor repair through hard surfacing

Pulper and flat screen rotors operate under corrosive and abrasive conditions and are therefore subject to wear. Voith Paper Vaassen repairs these rotors by hard surfacing. This restores the original geometry of the rotor blades and provides them with wear-resistant edges, thus achieving an optimum between operating costs and technological performance.

The company has access to construction drawings of all types of Voith rotors and of most non-Voith rotor types. Restoring the blade geometry to the original condition ensures the technological function of the rotor in stock processing is maintained without limitation. This specialized knowledge and extensive experience distinguishes Voith Paper Vaassen from its competitors.

## Multi-layer hard surfacing for high wear resistance

Voith Paper Vaassen's modern hard surfacing technique consists of applying a material which is wear-resistant, reweldable, and resistant to corrosion and cracking. A buffer layer stops any cracks that may develop in the wear-resistant top layer during operation from extending into the base material. This prevents crack-induced fracture of the rotor blades during operation, and ensures optimum wear protection at the same time.

Voith Paper Vaassen provides a lifetime guarantee against rotor blade fracture due to cracking, provided the manufacture and all subsequent repairs of the rotor have been undertaken exclusively by Voith Paper Vaassen.

## Innovations in material and process technology

Voith Paper Vaassen continuously researches new methods and improved materials for providing even better hard surfacing, including a proprietary welding wire manufactured exclusively to Voith Paper specification.

A new technique has been developed for hard surfacing rotors using a welding robot. This provides reproducible restoration of the original rotor blade geometry.


*The Voith Paper B.V. Service Center in Vaassen, Netherlands.*

*Fibersorter rotor.*

Another speciality is the repair of screws for reject, fiber and sludge presses by hard surfacing using special wear-resistant welding material, thus considerably extending operating life.

The repair methods and material specifications used by Voith Paper Vaassen have been taken over as a Voith Norm for Voith Fiber Systems Service Centers worldwide. This ensures a uniform high quality for all rotor and screw repairs.

## Manufacture of rotors

Voith Paper Vaassen's welding expertise also includes new rotor production. A welding robot using two welding processes – MIG (Metal Inert Gas) and PPAW (Plasma Powder Arc Welding) – provides new rotors with an extremely high wear-proof surface that ideally combines material hardness and ductility. This prevents material breakaway problems that can occur with some products.

## Maintenance of stock preparation machines

Many papermakers still maintain and repair their own stock preparation machines. However, more and more mills are coming to Voith Paper Fiber Systems because of our day-in, day-out maintenance work and vast experience from thousands of installations worldwide. Our knowledge of specific system behaviour in plants handling a wide variety of fibers is a further significant advantage.

Customers benefit not only from getting their machines back on line again

*UniPulper rotor.*

faster, but in many cases we can also offer small but effective innovations to these machines. Longer operating life, greater reliability and better stock preparation results are only some of Voith Paper Fiber Systems' contributions to life cycle cost reduction.

Using a special checklist, our engineers assess both Voith and non-Voith machines to identify problems. The customer then receives a precise description of the state of his equipment before and after maintenance work. Any measures that might have to be taken in future are also discussed, such as general overhaul work, repairs or rebuilds.

## Service contracts

A growing number of customers have their machines maintained on a contract basis with Voith Paper. These service contracts can be either all-inclusive (including maintenance work, spare parts, repairs, replacements, overhauls, etc.), or may only cover some of these aspects. Individual parts, such as rotors and bearing assemblies, can be made available to the customer for the duration of the agreement. The repair and overhaul of these components then forms an integral part of the contract. Typical for such agreements is a fixed monthly payment for the duration of the contract.

Examples of such service contracts:

- Board and packaging paper mill in the UK.
  Since 2000, all rotors have been repaired in Vaassen. Transport costs and technical support for the customer are included.
- Board and packaging paper mills in the Netherlands and Germany.
  Maintenance of UniPulpers. In both agreements, a spare rotor is made available to the customer for a period of 5 years. At planned intervals, other wear parts such as screen plates, screen plate bars, packings, etc. are delivered and installed.
- Tissue mill in the Netherlands.
  Complete maintenance of 10 stock preparation machines over 5 years, including delivery of wear parts, availability of spare parts, and all maintenance and repair work.

### Contact


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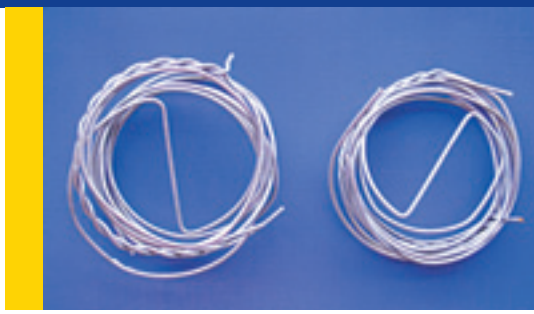
# From idea to installation – Market launch of an innovative pulp bale dewiring machine

**At the beginning of 2005 the engineers at Voith Paper Euskirchen, Germany (formerly B+G Fördertechnik) started development work on a new dewiring machine for single pulp bales. While the existing machine had a high capacity, it no longer satisfied the other parameters of modern handling technology. After a detailed evaluation of customer needs and market demands, the development objectives of optimal capacity and dewiring efficiency at reasonable cost were established.**

The new concept should also incorporate well-proven components such as the wire cutter and coiler head of the unit dewiring machine. These initial considerations were soon converted into sketches and draft designs.

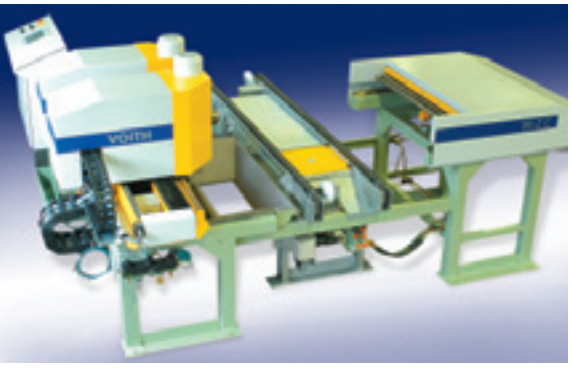
At the same time our Japanese colleagues at Voith IHI received a project enquiry for an automated pulp bale dewiring machine. We therefore had to decide which machine to offer, particularly with such a short delivery deadline of only six months. We no longer wanted to offer the old version – and we could not yet offer the new one which didn't even have a name. In the end we called it the BE-Z "C" model, following on from previous



model designations and reflecting its average capacity of 100 bales per hour. After joint discussions we gave all available information to our Japanese colleagues and put together a PowerPoint presentation. This was then adjusted and extended in Japan to suit local market requirements.

Our colleagues in the Land of the Rising Sun very quickly convinced their client of the advantages of the new bale dewiring machine and we received the order just three weeks later. This put our development people under considerable pressure, since the delivery date had already been fixed.

When all the mechanical components were ready in our Euskirchen works, the machine was completely wired and started up. Everything worked fine straight away so that we were able to invite other interested customers to witness bale dewiring trials on their own problem bales. Nearly all of them accepted our invitation, and returned home with a very positive impression. We would have liked to continue with these customer demonstrations, but unfortunately our delivery deadline in Japan for the first machine did not allow this.



Seven weeks later – in Japan.
Our commissioning engineer was highly impressed when he arrived on site in Japan. Not only was the machine completely assembled and wired, but also fully operational except for some small final adjustments. We were thus able to start straight away on the throughput and dewiring efficiency guarantee trials, all of which the customer followed very attentively. The guaranteed throughput was easily reached, and the dewiring efficiency of 98% won a standing ovation.

The operating concept of the new BE-Z “C” machine is quite different from that of its predecessors. For the first time, the complete range of modern handling technologies have been incorporated into a single machine: hydraulics, pneumatics, electric motors and servo systems.The travelling wire cutter unit is located on one side of the machine, and the positionable coiler heads on the other side. The centrally located chain conveyor incorporates an elevation platform with combined lifting and swivelling cylinder. The bale wire locations are automatically detected by sensors which position the coiler heads exactly against the wires when the bale has been lifted into position. When the wires have been cut on the other side of the bale, the rotors in the coiler heads then coil the wires into small, compact and easily handled bundles.

After each cycle, all components automatically return to their start position. At the same time the coils of wire are ejected onto a conveyor belt for disposal in a container, and the raised bale is rotated through 90° ready for dewiring on the second side.

The most outstanding advantage of our new machine is its extremely high dewiring efficiency. But all other important features are in place, too: the usual very high reliability and runnability, a robust design, minimum floor space and the very attractive price-performance rating.

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# Holmen Paper Madrid “Peninsular” – New world record start-up speed for newsprint machines

**Holmen Paper AB commissioned their new Voith PM 62 standard newsprint machine in their mill in Madrid, Spain, so successfully that it went on line in only five weeks – thanks to the One Platform Concept with well-proven technology. The first test with stock on wire took place on November 11, 2005, and after thoroughly testing the wet and dry ends under operating conditions, paper on reel was attained on November 13 – only 36 hours later. The start-up speed of 1,640 m/min set a new world record for newsprint machines.**

| Voith production lines currently operating at Holmen Paper | | | | |
|---|---|---|---|---|
| | PM No. | Wire width (m) | Capacity (t.p.a.) | Paper grades |
| Hallsta Paper Mill | PM 2 | 5.75 | 110 000 | Magazine, letterpress |
| | PM 3 | 7.10 | 140 000 | SC paper |
| Braviken Paper Mill | PM 51 | 9.15 | 180 000 | Telephone directory, light newsprint |
| | PM 52 | 9.15 | 270 000 | Newsprint |
| | PM 53 | 9.65 | 300 000 | Newsprint |
| Holmen Paper Madrid | PM 62 | 9.65 | 300 000 | Newsprint |

Stable quality was achieved immediately after first paper on the reel. After fine-adjusting the auxiliary systems and CD/MD profile control, first-class saleable newsprint was already produced a few days later. Thanks to the ideal machine layout and very high profile stability, runnability and printing results were excellent right from the beginning.

## Holmen Paper – more than 95 years of partnership with Voith

Holmen Paper AB of Norrköping, Sweden is, with 2,500 employees, one of Europe's leading producers of printing paper. Apart from the Madrid mill, the three Swedish mills are located in Braviken, Hallstavik and Vargön. Production output of the eleven paper machines in these mills totals 1.8 million t.p.a. of coated and uncoated wood containing printing papers, mainly for newsprint, magazines and inserts, advertising materials and telephone directories.

Out of the fourteen Voith paper machines sold to Holmen Paper during the last 95 years, six are still in operation. The long-standing partnership between Holmen Paper and Voith dates back nearly a century. The company's first Voith paper machine went on line in Norrköping as long ago as 1911, followed by two further machines in 1927 and 1931. Three Voith paper machines started up between 1915 and 1917 at Hallsta Pappersbruk, which, at that time, was Europe's biggest newsprint mill. The fourth machine was added in 1938, and from 1958 to 1967 three more Voith machines were installed in Hallsta. At the Braviken mill three new Voith paper machines started up between 1977 and 1996. PM 62 at the Madrid mill is the latest addition to Holmen's "Voith collection".

Over the years, many of these machines broke several world speed records for newsprint production.

## Holmen Paper Madrid

The Papelera Peninsular paper mill, built in 1998 by Grupo Unipapel, was acquired by Holmen Paper in 2000 and renamed "Holmen Paper Madrid". The entire output of this mill, with more than 350 employees, is based on recovered paper furnish mainly collected in Spain and Portugal.

*EcoCell deinking system, heart of the recovered paper preparation line.*

*MultiSorter coarse and MultiScreen fine screening, with C-bar baskets and Multi-Foil rotors.*


*TopDuoRun Drying section and Sirius reel.*

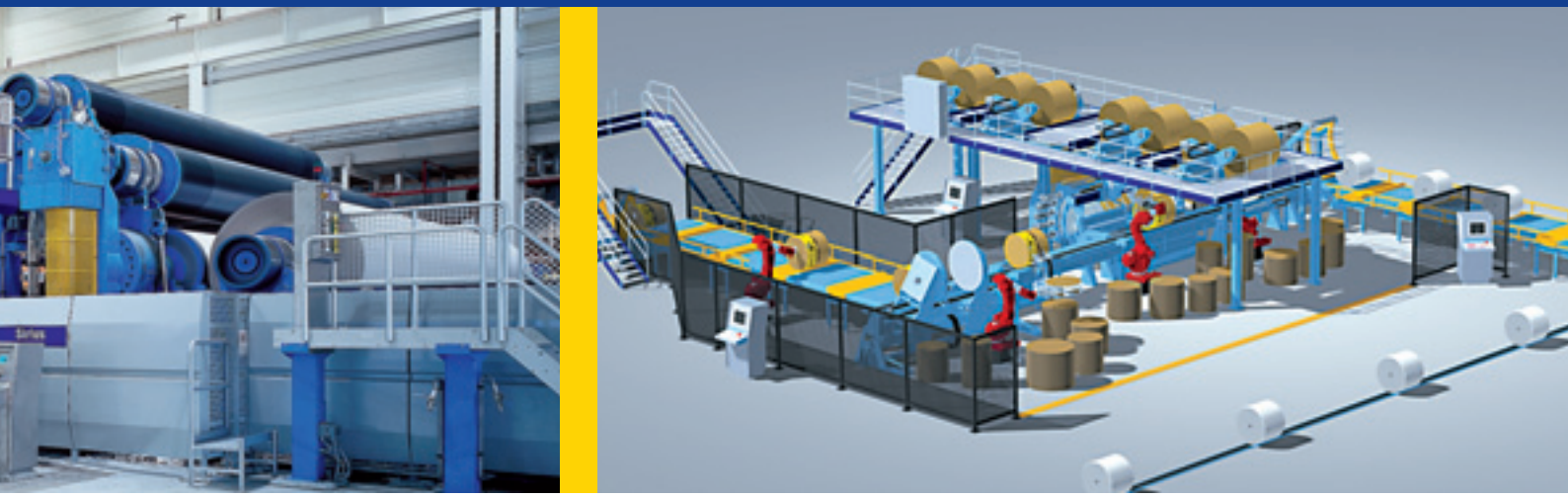
The two paper machines (PM 61 and PM 62) can produce 470,000 t.p.a. of newsprint, uncoated and lightly coated magazine paper, mainly for marketing on the Iberian peninsular.

The new Voith machine that came on line in November 2005 has a design capacity of 300,000 t.p.a. newsprint from recovered paper, with a basis weight of 40-49 g/m$^2$. PM 62 has a wire width of 9,650 mm and a design speed of 2,000 m/min. The investment cost totalled 306 million Euro.

## A One Platform Concept production line using well-proven technology

Based on the One Platform Concept, this complete production line includes a DuoFormer TQv with Voith BlackStone S rubber roll covers, in combination with a MasterJet G headbox with OnQ-ModuleJet and Profilmatic control to ensure first-class formation. The Tandem NipcoFlex press, fitted with G2000 polyurethane roll covers, OnQ-ModuleSteam steam box, and transfer belt to the second nip, guarantees the highest dryness content at optimal paper quality. Immediately after the press section is the OnQ-EnviroScan moisture measurement system enabling fast-response control of sheet moisture content. The drying section is equipped with advanced TopDuoRun drying technology and with OnQ-ModulePro moisturizers for moisture cross-profile and curl control.
The web finally passes through an EcoSoftDelta softnip calender fitted with Vantis S roll covers, that is equipped with gloss and CD thickness profile control and a steam blow box. This is followed by the state-of-the-art Sirius reel.

All the parameters affecting winding quality can be displayed and optimized on the RollMaster control panel. Well-proven Fibron vacuum technology enables ropeless tail transfer throughout this high-tech production line, which is rounded off with two VariFlex winders with VariTronic process control and a high-capacity Classic roll wrapping machine. Voith supplied the entire paper machine automation system including OnControl process control, OnQuality quality management system with MD and



*Roll wrapping machine Classic.*

CD profile control, and OnView information system with trend recognition and reporting functions covering all the machine and technology monitoring systems.

Apart from the paper machine itself, Voith also delivered the key components critical for efficient operation of PM 62's recovered paper deinking line and approach flow. The line has a capacity of 1,000 t/24 h finished stock.

Here Voith supplied a PreClean Protector system to ensure effective stock cleaning, MultiSorter coarse screening with an integrated IC slotted screening module for optimum screening efficiency as well as MultiScreen fine screening.

An EcoCell pre- and post-flotation deinking system forms the heart of PM 62's recovered paper preparation line. For dispersion Voith supplied its biggest DX disperger with the highest production throughput up to now. The DX type disperger is designed for direct steam heating.

An iConRet retention controller is installed in the Wet End Process for optimum retention agent metering.

Voith took over the guarantees for the complete deinking plant and ensured that the required stock quality and production were achieved directly after commissioning, thus fitting in with PM 62's fast start-up performance.Previous supply of the complete deinking line for Peninsular's PM 61 had already secured Voith's good reputation within the Group.

## Erection, commissioning – and a picturebook start-up

The Voith erection team started tackling this project in April 2005. When the foundations were ready, the first pre-assemblies were brought by special transport from the port of Bilbao to Madrid. Thanks to extensive preassembly in the Voith works, optimal product quality was assured with minimal time spent for final assembly on site. This enabled the punctual completion of erection by the end of September 2005.

In parallel to the erection work, a comprehensive theoretical and prac-

*“Nobody here thought such figures were possible, our paper roll store is almost full.”*

*Anders Öquist, Holmen Paper Madrid*

tical training program was arranged for the Holmen operators, mechanics, electricians and control system technicians to optimally prepare them for the start-up. The result of all these training sessions, led by Voith experts, was a picturebook start-up in November 2005. It even set a new world record of 1,640 m/min for newsprint machine start-up speed.

A couple of months after start-up, Voith Paper Fabrics installed PrintForm HC wires (part of the PrintForm H Series of forming wires) at the inner and outer position of the DuoFormer.

The wires showed good formation and drainage properties, high service life and stability and helped the customer to increase machine speed. With Voith Paper Fabrics‘ forming wires and technical service, the customer was able to optimize the performance of the PM 62 forming section. The customer’s satisfaction was reflected in an additional order for more of these forming wires.

The paper machine currently operates at 1,750 m/min on the Sirius reel with good time efficiency and minimal broke. A further speed increase is planned. In February 2006 production output had already reached 661 t/day (as against the planned 584 t/day), and at the end of the first week in March production was 879 t/day. Currently the line is operated for about 640 t/day. “Nobody here thought such figures were possible”, said mill manager Anders Öquist, “our paper roll store is almost full – because we’re already producing more than Holmen originally planned for”.

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# Ettringen PM 4 – ProQuality rebuild “MyFuture44”

**Lang Papier Ettringen, a subsidiary of the Finnish Myllykoski Corporation, decided in December 2004 to improve its SC paper quality by modernizing PM 4. On December 16, 2004 Voith Paper was entrusted with the rebuild, which was completed in September 2005.**

The scope of supply covered a ModuleJet dilution technology retrofit to the existing SymFlo headbox, conversion of the Symformer HHS to state-of-the-art DuoFormer TQm technology, and installation of HiVac highvacuum suction box and five ProRelease⁺ stabilizers in the third dryer group. Significant extension work was also undertaken in the DIP line and approach flow.

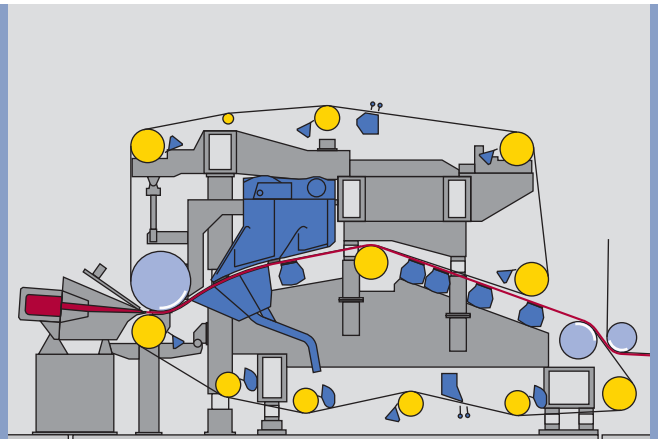
This ProQuality rebuild was mainly directed at better printability and runability as a function of formation, 2-sidedness, profile stability and fast grade changing. This report summarizes the main measures taken in the stock preparation and approach flow, on the headbox and former.

## Stock preparation

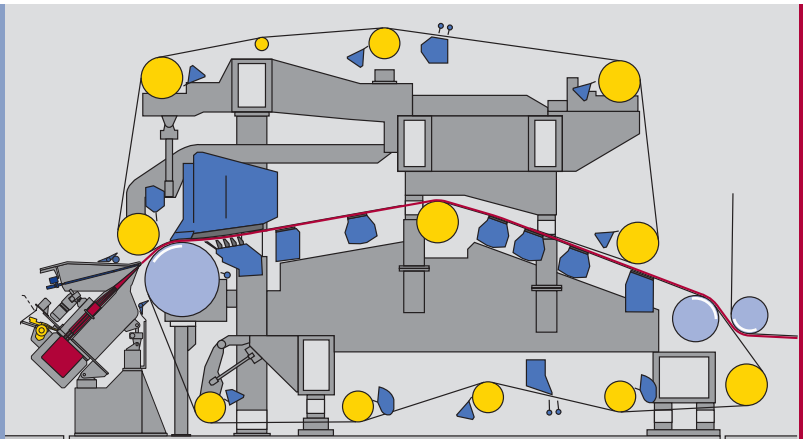
To comply with more stringent cleanliness requirements on the end product, the DIP line was upgraded with new IC screening and EcoCell flotation. IC screening is used in recovered paper preparation when particularly exacting demands are placed on finished product quality. Inlet stock consistencies are typically around 2 to 2.5%, i.e. between MC and LC consistencies. In combination with the fine screening system, which was also upgraded, the new IC screening substantially improved stock quality, in particular as regards the reduction of stickies.

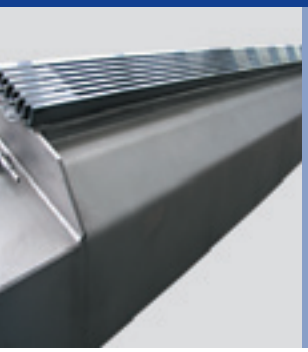
The new EcoCell flotation technology replaced old flotation cells and has

*Situation prior to rebuild.*

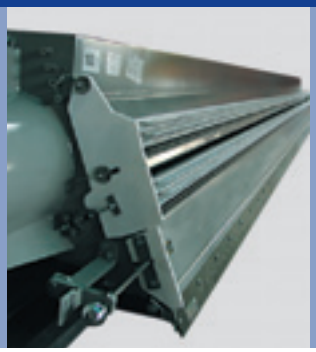


*DuoFormer TQm after rebuild.*

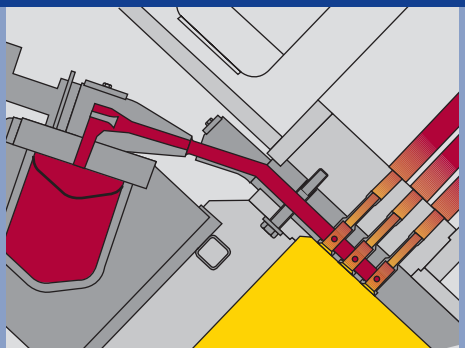




*HighVac high-vacuum suction box.*



*ProRelease⁺.*



*ModuleJet-DR LC dosing.*

*ModuleJet valves with Profilmatic actuators on the LC distributor pipe.*

made another important contribution to achieving the required stock cleanliness.

## Approach flow

The approach flow was rebuilt with Advanced Wet End Process components, including the following:

### ComMix

Premixing in the mixing pipe with offset inlets. Static fine mixer. High flexibility for accommodating varying stock compositions.

### VoithVac

Improved hydraulic stability for a stable paper machine operation.

*EcoCell flotation.*

### MultiScreen MSA screening

Optimized throughflow for maximum screening efficiency. Well-proven technology for minimized pulsations.

The rebuild measures substantially improved both the hydraulic and consistency stability. This is reflected in the excellent MD profile now obtained.

## ModuleJet-DR

The ModuleJet-DR dilution retrofit feeds dilution water through a dosing plate between the cross-flow header and the manifold tube bank. ModuleJet valves on the LC header control the dilution water dosage rate. Basis weight control is taken over by the Voith Profilmatic system.

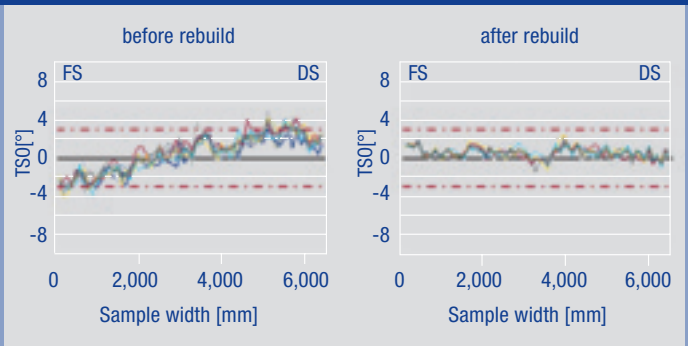
The headbox rebuild was completed in 3.5 days. On September 20 PM 4 was shut down for dismantling. The subassemblies could be transported to Heidenheim for machining and reassembly.

Dismantling of the 50-tons headbox and transport to Heidenheim went very smoothly. On September 21 work already started on fitting, aligning and fastening the new headbox dosing plate before installing and grinding the injection inserts. After fitting the HC header, the new LC header with ModuleJet valves was attached to the headbox. The new cover plate with wind deflector was then fitted, together with the reutilized shower pipes. Toward 3 a.m. on September 24 the rebuilt headbox – now weighing 55 tons – left Heidenheim, and at around 2 p.m. it was already in place on site.

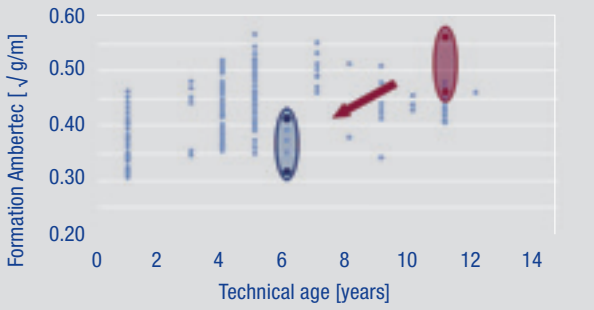
The headbox rebuild has brought remarkable paper quality improvements. PM 4 now delivers basis weight profiles comparable with those attainable on new state-of-the-art machines. Immediately after restart the 1sigma-Tapio value for basis weight cross-profile improved to < 0.4%.

On page 41 is shown the Tapio basis weight profiles as measured in the laboratory before and after the rebuild.

Even without subsequent headbox gap optimization, fiber orientation is first class. The cross-profile has improved to +/-2° as against +/-4° prior to rebuild. This proves that a rebuild with ModuleJet-DR installation is a highly efficient way of greatly improving the basis weight and fiber orientation profiles.




*Fiber orientation cross-profiles before and after rebuild.*




*Formation improvement*

## DuoFormer TQm

Our goals in rebuilding the former were in particular to optimize 2-sidedness as well as formation. We had of course discussed at an early phase the merits and consequences of installing a new DuoFormer TQv, but a thorough check on the existing former showed that these goals could be reached with a DuoFormer TQm (where “m” means modified).

The breast roll and forming roll were swapped over. To this purpose the forming roll was modified for use in the bottom wire, and the headbox had to be repositioned as well. Reutilization of the cantilever system was an extremely important requirement.

The two drainage blades on the top wire were replaced with the top wire suction boxes of the well-proven D-section, and adjustable drainage blades were installed on the bottom wire. The subsequent suction boxes on the bottom wire round off the new DuoFormer TQm drainage concept.

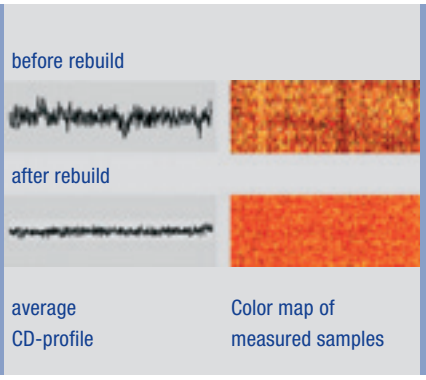
Apart from the excellent profile values mentioned above, this rebuild also brought outstandingly good formation, as shown in particular by comparison with third-party machines. Formation has improved by 25% and is now in the upper reference range for new machines on the SC market. Ash distribution 2-sidedness is excellent at 6%.

By using intelligent and effective solutions, a large improvement potential has been exploited to significantly improve printability and runability. As a result, the SC proportion of PM 4 production output has been increased in the meantime.

Particularly notable throughout this project was the outstandingly good cooperation of the Ettringen team, who provided us with all available data and were ready at all times for discussions and optimization measures.

The resounding success of this “Myllykoski Future for PM 4” project is further proof of the effective teamwork between Lang Papier and Voith.

*Tapio basis weight profiles.*




*Dosing plate installation on the headbox.*

### Contact

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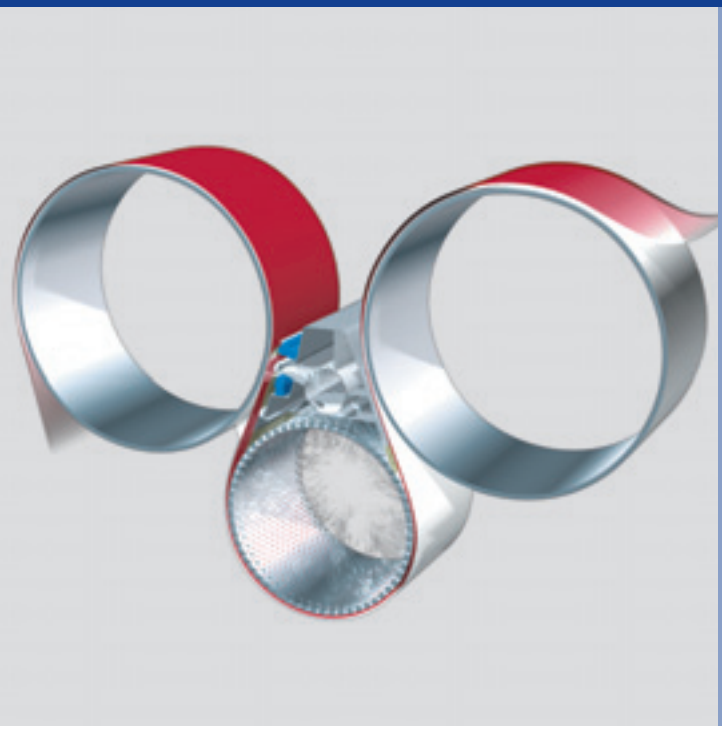
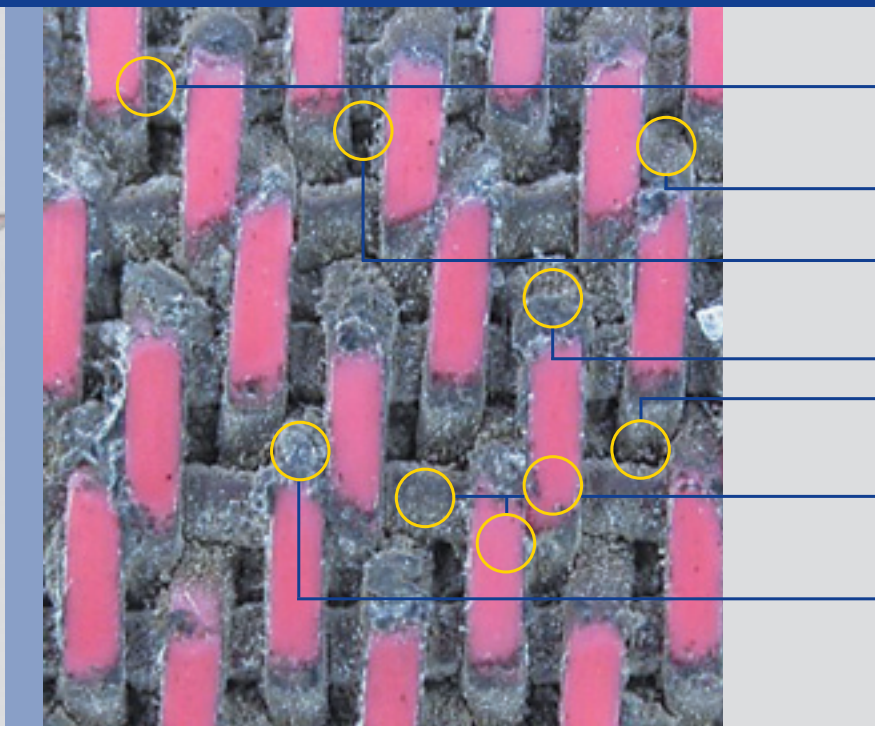


*Single Tier Dryer.*



*Areas where contaminants adhere to the dryer fabric.*

# New fabric technology for single tier drying

**The fabric development team at Voith Paper continually tests different ways dryer fabrics can be designed to maintain the performance of the dryer section throughout fabric life. The latest development is a new fabric design concept that has exceeded the customer requirements of the paper machine trial.**

The fabric is an essential part of a dryer section. It transmits under pressure to the sheet to improve runnability; provides uniform sheet contact to improve heat transfer for evaporation, and it drives most of the cylinders, vacuum and felt rolls.

During the past 10 years there has been continuous evolution of sheet control, machine layout and cleaning equipment to improve machine efficiency and increase operating speeds. However, apart from minor changes to yarn material or profile, most paper machines are still running the same dryer fabric weave patterns and spiral structures. Voith Paper Fabrics recognized this and began the process of developing dryer fabric technologies, adapted to the newest machine concepts.

## Understanding the process

Papermakers need low permeability fabrics (between 95 to 125 cfm) in the first dryer groups for good interaction

| Sites for contamination | Critical Success Factors | Target |
|---|---|---|
| Number of yarn crossovers | Every converging junction between MD and CMD yarns is an opportunity for a contaminant to become trapped between the two surfaces. | Reduce the number and distance of contacts between yarns. |
| Number of MD and CMD layers | Contaminants can become trapped between layers of yarn inside the fabric. | Minimize the number of fabric layers. |
| Structural void volume | Cleaning systems can clean fabric surfaces, but the water jet is less effective in cleaning inside structural voids of the fabric as the force of the water jet is dissipated. | Reduce the structural void volume. |
| Aperture size | Fine apertures are easier to plug with contaminants. | Increase the size of apertures. |
| Aperture movement | "V" shaped apertures of fabrics need to be flexible as this can help to loosen contaminants for easier cleaning. | Maximize the MD flex points at the apertures. |
| Number of MD and CD yarns the cleaning nozzle jet sprays at in a 90° angle | The cleaning force from the high pressure water jet is dissipated on contact with the fabric surface. The fabric yarns can fibrillate if the pressure is too high or the nozzle is to close to the fabric. | Ensure that at least 50% of every yarn has direct contact with the water jet. |
| Distance between two MD yarns where the contamination accumulates until it reached the surface | Contaminants of baked pitch and fibre grows behind a yarn contact point to close the apertures. The following apertures become closed with the growth of the burr. | An aperture always follows each contact point, however position the next aperture as far away as possible. |

with sheet control equipment for tail threading and runnability. Aerodynamic, low thickness fabrics have layers of machine or cross machine yarns that are woven closely together. This creates locations for contamination on the fabric surface or in the structure. Contaminants such as stickies from the paper or dust from fillers and fines are pressed or filtered into the fabric reducing its effectiveness.

Voith Paper studied samples from fabrics that had run on different paper machines and identified the locations where contaminants adhered to the fabric. The critical success factors were determined in order to create a theoretical model for fabric performance (see above figure). In addition, the theoretical fabric would also have to satisfy the requirements for easy installation, wear resistance, CMD stiffness and length stability, with optimal paper quality.

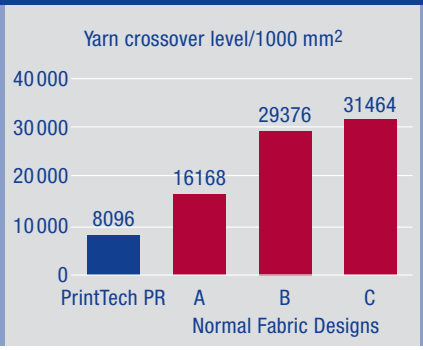
## Finding a solution

The second stage of the development process was to design a fabric structure to match the values of the theoretical model as shown in the Critical Success Factor table. Because this was not possible using conventional interlacing of warp and weft in dryer fabrics, a loom had to be modified to create the desired effect for papermaking. The resultant fabric structure was completely different from normal dryer fabrics and combined the elements of both woven and spiral fabrics.

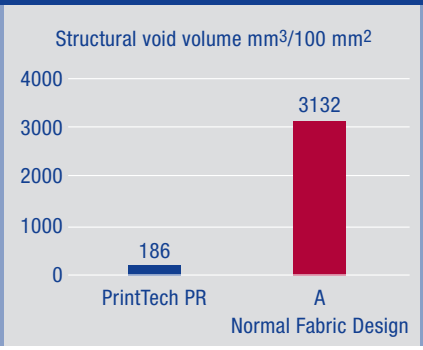
The properties of the new fabric design achieved the targets for customer success criteria on demanding first dryer groups of high-speed paper machines using recycled furnish.

According to industry opinion, surface contact points and contact area are two factors that influence drying-efficiency. However, there is no standard measuring system for contact area as values quoted are often tested at several thousand times greater pressure than the paper is subjected to between the fabric and the cylinder.

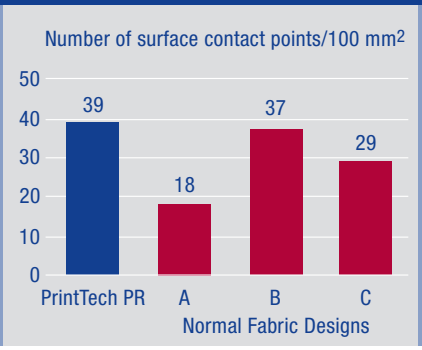
Therefore, the accurately measured number of contact points on the fabric surface were increased for better heating up of the sheet.




*Yarn crossover level*
*Every converging junction between MD and CMD yarns is an opportunity for trapping a contaminant between the two surfaces.*




*Structural void volume*
*On-machine cleaning systems can clean voids at the fabric surface, but are less effective at removing contaminants from the internal structural voids to maintain sheet control. The structural void volume of PrintTech PR has been nearly eliminated.*




*Number of surface contact points*
*The new concept of dryer fabric has a Negative Pressure Matrix (patent applied for) and large apertures at its paper-contacting surface. These are directly acted upon by the water jet of the cleaning nozzle and the high number of fabric contact points with the paper is retained.*

An under pressure matrix was created on both surfaces of the fabric in order to transmit the under pressure from sheet control systems to the sheet around any surface contaminants during the life of the fabric. This was done with the objective of maintaining optimum tail threading and sheet runnability throughout fabric life.

## Successful trial

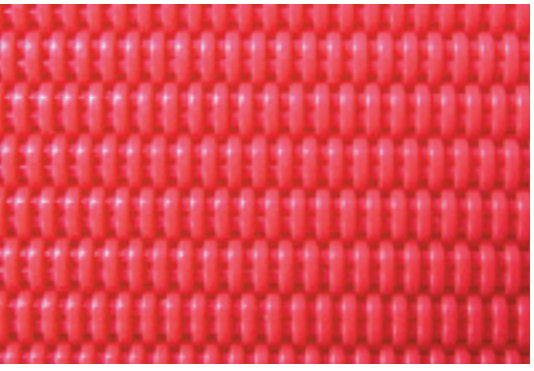
The match between theoretical and resultant structure was excellent and the project progressed to the third stage of producing and running a trial fabric on the 1st dryer group of a high-speed graphics paper machine.

The 9 m wide fabric was easily joined at the seam and started up well with good tail threading and sheet runnability. The press section has a closed web run and requires a high vacuum from the transfer belt to the dryers, which can increase the risk of web mark defects due to dryer fabric marking. Image analysis of paper samples showed that the trial fabric's unique surface, structure and apertures maintained the normal mark intensity through the dryer section.

Fabric permeability retention and profile level were better than target and the fabric was removed for evaluation after exceeding the running life requirements of the customer.

This new concept in dryer fabric technology has progressed from the theory to practice and has proven to run successfully on highest machine speeds under commercial papermaking conditions.

This new concept of fabric technology, PrintTech PR, will be made available for different paper grades on single tier dryer sections. It will run on demanding sections of paper machines with the target of maintaining the performance of the dryer section during the lifetime of fabrics for improved efficiency and operation of the paper machine.



*PrintTech PR.*

**Contact**

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# Klabin Brazil invests in a liquids packaging board production line

**The Brazilian Kraft liner and pulp producer Klabin ordered from Voith a complete production line mainly for liquids packaging board (LPB) but also for carrier board and folding boxboard (FBB). It will be installed at the company's main mill in Brazil, Monte Alegre in Telêmaco Borba, Paraná state.**

Klabin is Brazil's biggest producer and exporter of paper and board, and a leading supplier of packaging paper and carton, folding boxboard and bagging paper for industrial use.

Klabin was the first pulp and paper producer on the American continent to have its forests certified by the FSC (Forest Stewardship Council). This ensures a high level of contribution to environmental protection and social-economic sustainability.

In very close cooperation also with industrial users, the new production line has been conceived to take full account of customized liquids packaging requirements such as for milk and juices.

This contract, for one of the biggest orders ever received by Voith Brazil, will be executed according to the Process Line Package (PLP).

The new machine, with a wire width of 7,300 mm and a design speed of 1,000 m/min, will produce up to 1,100 tonnes per day of high quality board in a basis weight range of 170 to 390 g/m$^2$ to meet both national and international market requirements.

Included in the Voith scope of supply are the following One Platform Concept installations: the entire stock preparation line, the approach flow section, slitter-winder, paper roll transport and wrapping system, paper machine auxiliaries and electrical installations, erection and commissioning. As part of Voith Paper's Process Line Package, Voith Paper Fabrics will be supplying three full sets of paper machine clothing from the MultiPlatform (MultiForm, MultiFlex and MultiTech) for this machine, and Voith Paper Rolls will deliver special roll covers and coatings for the individual paper machine sections.

This very important project for Brazil is an excellent example of Voith's commitment to supporting the paper industry in South America. The start-up of the production line is planned for September 2007.

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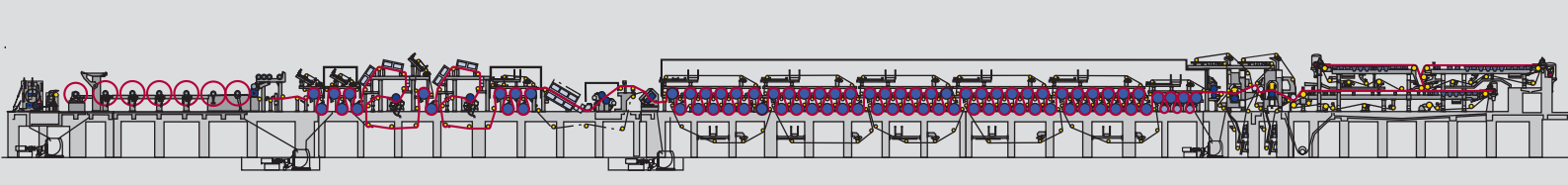

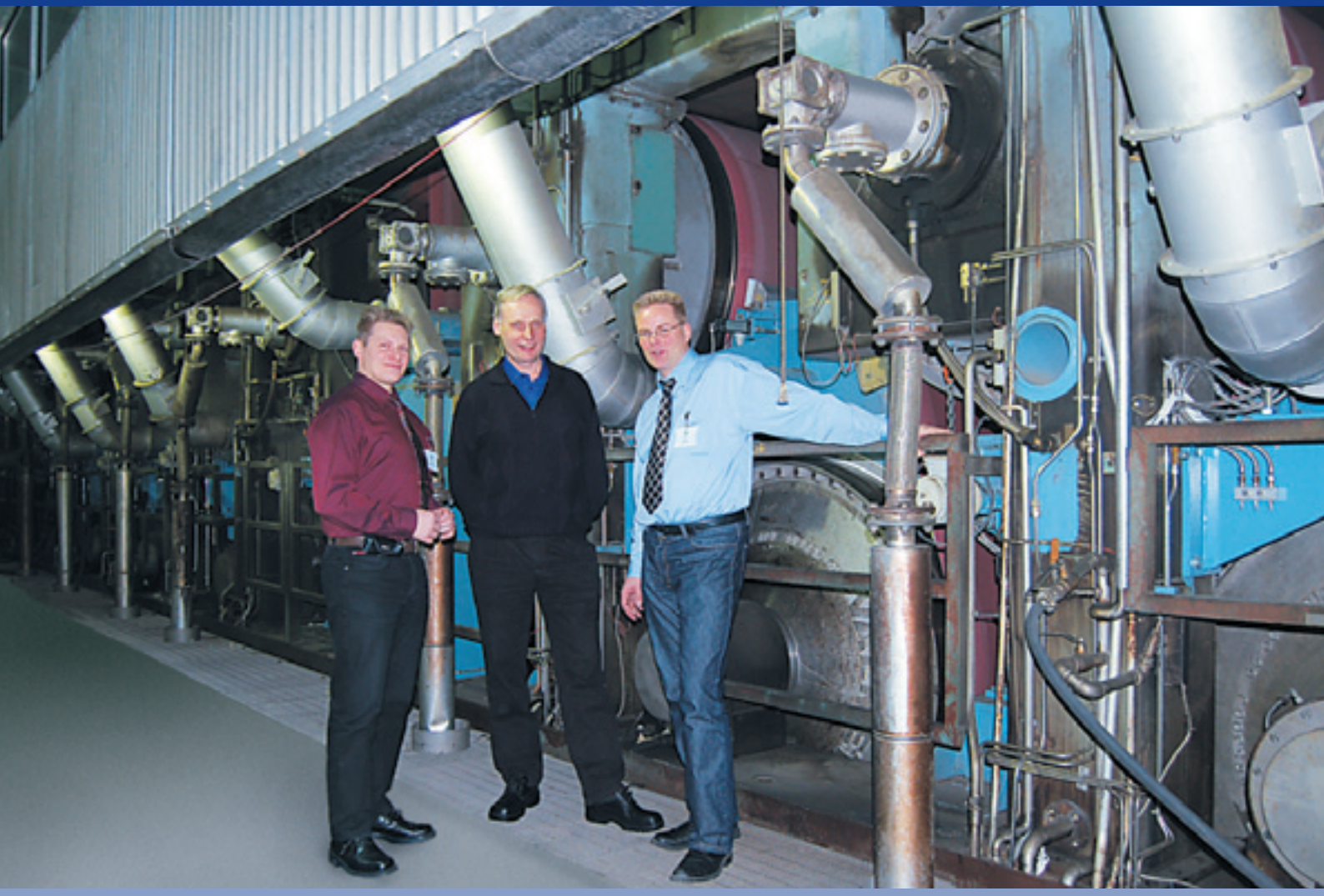

# UPM Kaipola – a Perfect Fit rebuild

**“It is not often that you can say a project has gone so well! I wish to express my heartfelt thanks for a very successful performance. The project was carried out in an exemplary manner in every respect.”**

Juhani Kauppila, PM 7 production manager at the UPM Kaipola TD paper mill, sent this message to the Voith Paper staff in Finland. He was praising the rebuild project carried out by Voith in Kaipola last year. Major technological changes proposed by Voith were made in the dryer section of the paper machine in order to improve the paper machine's runnability. The outcome of this challenging work was excellent. On the UPM side the project was led by Kauppila, while Voith Paper Oy's project leader was Jani Kivelä.

Kaipola paper mill is part of the UPM-Kymmene Group. UPM is one of the world's leading forest industry companies and the clear market leader in magazine paper. The Kaipola mill in central Finland has an annual production capacity of over 700,000 tonnes of paper. Directory paper and newsprint produced on paper machines 4 and 7 account for more than half of this volume.

PM 7 produces 230,000 tons of TD and newsprint annually. The machine's wire width is 9,150 mm and its maximum speed is above 1,600 m/min. The raw material mix is mechanical pulp and about 60% recycled fiber. The paper machine started up in 1989. The end product has changed several times throughout the years towards lighter paper grades. Today, the main product is directory paper with a basis weight range of 34-45 g/m$^2$; the annual average basis weight is 38 g/m$^2$.

*UPM Kaipola, Finland.*

*Above left: Juhani Kauppila (center) with project manager Jani Kivelä (left) and Juha Behm of Voith Paper Oy in front of the new dryer section.*

## Rebuild for a perfect fit again

UPM's goal was to improve the runnability of PM7 by rebuilding the 4th, 5th and 6th dryer groups. The project also included ropeless tail threading, which was also delivered by Voith.

In its early stages the project was complex – the paper machine had started to produce lighter paper grades and, as a consequence, drying capacity exceeded production requirements. For this reason, some of the cylinders in the paper machine had already been closed down when producing lighter grades. Because of the available drying capacity UPM assumed they could change to the single tier system and at the same time improve the support of the web. Based on this Voith offered the required DuoStabilizers for three dryer groups and drilling of the bottom dryer cylinders. Stabilizing the web improves runnability, which thereby reduces web breaks. At the same time the web stays fixed to the dryer fabric, which reduces paper fluttering and facilitates tail threading. Good support also enables an increased web width.

UPM was taken by the offer and Voith secured the contract to deliver thirteen DuoStabilizers for dryer groups 4, 5 and 6 and to carry out the on-site drilling of 13 drying cylinders. The drilling and mechanical installation were performed by Voith's Finnish subsidiary Pikoteknik Oy. The delivery also included 13 new doctors. Rebuild work was completed in October 2005.

**Tribute by Juhani Kauppila**

"At the quotation stage Voith took a realistic and serious look at the rebuild, and all submitted information on the advantages of the rebuild and the sufficiency of the drying capacity was up-to-date," says Kauppila.

"We regarded this project as feasible because the beginning of the dryer section had already been realised as a single tier system. However, the sufficiency of the drying capacity was an obstacle that needed to be overcome. Whether or not it would be sufficient was a central consideration, especially as opposing views were expressed," said Kauppila after the rebuild.

"However, Voith's proposal was considered a good solution. Furthermore, its simple method of implementation was very interesting, as was the fact that all the work could be carried out during a short nine-day shutdown period.

"Since the rebuild, we now know that the drying capacity is definitely sufficient. Of course, based on the calculations, Voith was convinced from the start – as was I – that the drying capacity would suffice. We also discussed what might happen to the paper when drying it very aggressively and how this thin paper might change its behaviour. This issue has been settled after the rebuild to our full satisfaction. Furthermore the paper web coming out of the machine is wider, which was one of our goals. Following the rebuild it is now approximately 13 centimeters wider than before," explains Kauppila.

On Kaipola's PM 7 a lot of efficient work was carried out by professional teams on all sides. "Different skills and a combination of these can only bring a good end result," says Kauppila.

## Extension of the RCF line ordered back in 2004

"I wish to express my heartfelt thanks for a very successful performance. The project was carried out in an exemplary manner in every respect. For this I would like to thank the staff at Voith who participated in this project." – Juhani Kauppila.

In mid-2004 UPM-Kymmene Kaipola enlisted Voith Paper Fiber Systems to extend the existing RCF (recycled fiber) plant. Aim of the rebuild was to increase production from 440 to 540 t/24h and to improve the DIP quality.

The RCF line, which already included Voith components, was modernized by adding a 3-stage IC screening system with integrated cleaner plant. As well as MultiScreens using proven C-bar technology, Voith supplied EcoMizer cleaners for efficient heavy contaminants removal and for extending the service life of working elements in the downstream machines.

At the same time, the existing pre- and post-flotations were upgraded by adding further flotation cells in the primary stage as well as a flotation cell with pump in the secondary stage. All flotation cells are equipped with EcoCell technology.

Voith completed the rebuild, including installation and start-up, in less than six months. Delivery took place within the agreed time at the end of November and in mid-December 2004. The installation work, supervised by Voith, was carried out on schedule and partly without stopping production. Commissioning and test runs were also completed on time. At the beginning of 2005 the RCF plant came back on stream with increased capacity and with improved stock quality. The customer expressed his full satisfaction, as indicated by his praise of the good project cooperation.

*Part of the recycled fiber line.*

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*Zaragoza*

# SAICA boosting production by another 400,000 tons – Two-million tons within reach

**On March 17, 2006, the new PM 10 at SAICA, in El Burgo de Ebro, was put into successful operation two months ahead of schedule. The first paper of 90 g/m² basis weight was wound on the reel at a speed of 1,030 m/min. The PM 10, with a wire width of 8,550 mm and a design speed of 1,800 m/min, produces 400,000 t/y of corrugating medium and testliner in a basis weight range of 75-145 g/m² from 100% recovered paper.**

With the start-up of PM 10, SAICA has become the largest producer of testliner and corrugating medium in Spain and operates a total of eight paper machines with an annual output of approximately 1.9 million tons at two locations in Spain and at two locations in France. SAICA is also the largest recycler of recovered paper, processing about two million tons in 2005.

## SAICA looking back on successful development

SAICA (**S**ociedad **A**nónima **I**ndustrias **C**elulosa **A**ragonesa) was established in 1943. The invested capital was around 3.5 million pesetas at that time. The successful history of the 100% family-owned group in Zaragoza, Spain, began with the paper machine PM 1, producing 1,937 t/y at 1.1 m working width. Straw pulp was mainly processed on the first paper machine. After producing various paper grades and pulps at the beginning, SAICA very soon specialized in producing testliner and corrugating medium.

In the years to follow, continuous investments were made in new paper machines, as well as rebuilds and upgrades. As early as 1954, the PM 2 with a production capacity of 3,150 t/y was put into operation. Over the years, the Zaragoza mill distinctly boosted its production, partly by upgrading the existing paper machines and partly by building new paper machines.

In 1992, the PM 8 with an annual output of 120,000 tons went online at the new mill in El Burgo de Ebro, about 25 km out of Zaragoza. In the meantime, it has been rebuilt and upgraded several times, now producing mainly up to 350,000 t/y of white top liner.

*Old PM 1 producing 1,937 t/y at 1.1 m working width.*

**Efficiency PM 9**

| Year | 2000 | 2005 |
|---|---|---|
| Production (net) (t/y) | 312,000 | 387,000 |
| Average PM speed (m/min) | 1,058 | 1,255 |
| Efficiency | 83.9% | 89.2% |
| Average basis weight | 103 g/m² | 92 g/m² |

*Contract signing for project SAICA 4 PM 10.*

In 1998, SAICA acquired the paper mill Papeteries de Gaves in Orthez, France, with one paper machine and, in 2002, La Rochette Venizel with two paper machines.

## Voith and SAICA – Many years of customer-oriented partnership

In January 1999, SAICA placed an order with Voith Paper for a new production line for corrugating medium at its El Burgo de Ebro mill. The stock preparation system, the paper machine and the reel were delivered according to an "all from one source" concept. The PM 9, which was put into operation in October 2000, still is the world's fastest and definitely the most efficient paper machine for corrugating medium.

Shortly after the successful start-up of the new PM 9 at El Burgo de Ebro, SAICA and Voith decided to intensify their cooperation beyond the normal scope of supply and contract to increase the PM 9 capacity and efficiency, as well as to enhance the corrugating medium quality.

From the beginning of this cooperation, it was clear to both partners that successful cooperation would depend on an intensive exchange of experience between them. Therefore, all optimization measures for the PM 9 were jointly planned down to the last detail before they were implemented. New developments and improvements were jointly worked out and then tested and optimized on the PM 9. SAICA and Voith fostered an open and intensive exchange of information even during realization of the PM 9 project and have further intensified the open customer/supplier relationship in recent years.

SAICA's well trained and highly motivated team has also contributed significantly to achieving SAICA's success and excellent market position.

With Voith Paper, SAICA has chosen the right and reliable partner, as is demonstrated by several figures given below. Although, since the start-up of PM 9, the average basis weight has decreased from about 103 g/m$^2$ to 92 g/m$^2$, the PM 9 production, speed and efficiency were considerably increased.

## Excellent partnership as key to placing of order for SAICA 4 PM 10

The excellent cooperation between SAICA and Voith is reflected in the fact that on May 20, 2004, SAICA placed an order with its preferred partner Voith Paper for another new paper machine PM 10, including stock preparation equipment, at its El Burgo de Ebro mill.

## Stock preparation, approach flow and broke systems

Voith supplied the key components for the stock preparation system, as well as the complete approach flow and complete broke systems. The

*TwinFlo double disc refiners for refining the long fibers.*

*EcoMizer cleaner plant.*

*Thune disc filters for thickening (background) and the final stage LC slot screening for the long fibers (foreground).*

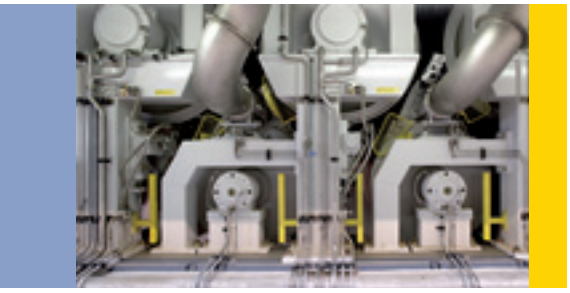

*New PM 10.*

approach flow is designed according to Voith's Advanced Wet End Process. It is equipped with the mixing elements ComMix and HydroMix and with VoithVac deaeration units for the top and backliner lines. In the subsequent screening system, low-pulsation MSA MultiScreens – specially developed for the approach – flow are installed in the top and backliner lines and in the dilution water line.

The machine broke is pulped down and then passed to a separate two-stage slot screening system before being returned to the production process.

In the fiber recovery system, the white water to be reused for the paper machine showers is clarified using a DeltaPurge and a Conus-Trenner, both from Meri.

*Improved framing of the dryer group.*



## Paper machine PM 10

Sheet forming takes place on a DuoFormer Base specially designed for producing packaging papers at maximum speeds. The DuoFormer Base has been dimensioned to allow for future speed increases and quality improvements of the machine.

The double-layer MasterJet M2 headbox is equipped with ModuleJet dilution water control. For CD basis weight profile control the Profilmatic-software is used in the back layer.

The press section is a DuoCentri-NipcoFlex press configuration and ensures maximum runnability. High-quality roll covers, such as Aqualis, PolyDyne and CeraLease SDe, are used. A zone-controlled ModuleSteam steam blow box ensures optimum dry contents and CD moisture profiles after the press.

The pre- and after-dryer sections, with a total of 47 dryers, use the TopDuoRun concept. ProRelease boxes are installed in the first two dryer groups to ensure excellent runnability at low basis weights and maximum speeds.

At the end of the after-dryer section, a ModulePro P is installed to control the CD moisture profile. A ModulePro C is used to control the web flatness.

For uniform starch application, a SpeedSizer unit with StratoSize

*Optimum winding quality by RollMaster on the Sirius.*

rubber roll covers is used. The carbon fiber rod beams allow to apply the starch solution at highest temperatures. A Voith Krieger Airturn allows optimum web transfer without contact from the SpeedSizer into the after-dryer section. The complete dryer section is equipped with a ropeless transfer system. In the area of SpeedSizer and Sirius, Fibron threading units are used. Together with the high-pressure water jet cutter in the wet end shortest possible transfer times are realized.

The web is wound on a Sirius reel, permitting roll diameters up to 4,000 mm. The RollMaster on the Sirius guarantees optimum winding quality. The parent roll change is effected fully automatically by means of EcoChange W.

Beside the automation products which were already mentioned, Voith Paper also supplied the complete basic engineering, and was responsible for installation and start-up.

## Installation and start-up

Project teams that are well adjusted to work together and the experience from five years of cooperation on PM 9 helped to continue the success shared by SAICA and Voith during start-up of the PM 10. As for PM 9, SAICA has again trusted in Voith's extensive process know-how. Successful installation and start-up of the complete machine two months ahead of schedule were accomplished through excellent cooperation in a spirit of partnership throughout the realization phase of this large-scale project. All persons responsible for this success really do deserve a big "Thank you".

**Technical data of PM 10**

| | |
|---|---|
| Wire width | 8,550 mm |
| Design speed | 1,800 m/min |
| Product | Corrugating medium and liner |
| Basis weight | 75 - 145 g/m$^2$ |
| Production (net) | 400,000 t/y |
| Raw material | 100% recovered fiber |

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# Working together and common goals

**On the occasion of the start-up of the PM 10, we ask Mr Francisco Carilla, Project Director, for an interview:**

**twogether:** When did you first think about building a new machine here in El Burgo de Ebro? What were the reasons?

**Carilla:** We started to think about it in late 2002 and made a decision in 2003. The main reason was to keep our paper business growing according to our company strategy. We wanted to maintain our position as a major player on the Spanish market as well as to strengthen our position in the European market. The mill was planned at El Burgo de Ebro, as we already had adequate land with the required infrastructures as well as motivated and well-trained human resources.

**twogether:** SAICA and Voith are united by long-term partnership. What, in your opinion, is the heart of this relationship? What is important to you in a customer/supplier relationship?

**Carilla:** The partnership was established for our previous Saica 3 PM 9 project. After the PM start-up, we signed several agreements enabling the two partners to share profits from their investments to make the new line more profitable.

We appreciate that the supplier listens to our experience, recognizes the problems and opportunities and puts the ideas into practice. Open communication, honesty, working together and common goals are the key to developing a climate of trust and to achieve good results for both the customer and the supplier.

**twogether:** What is your opinion of Voith's project handling competence and cooperation?

**Carilla:** Project handling was professional. Due to our long partnership and based on the experience of Voith and Saica from similar projects, the whole project has run smoothly. Voith St. Poelten efficiently coordinated the different Voith locations and sub-suppliers without any major problems.

**twogether:** The machine started up two months earlier than originally planned. How did you experience the last months? What does this early start-up date mean to business?

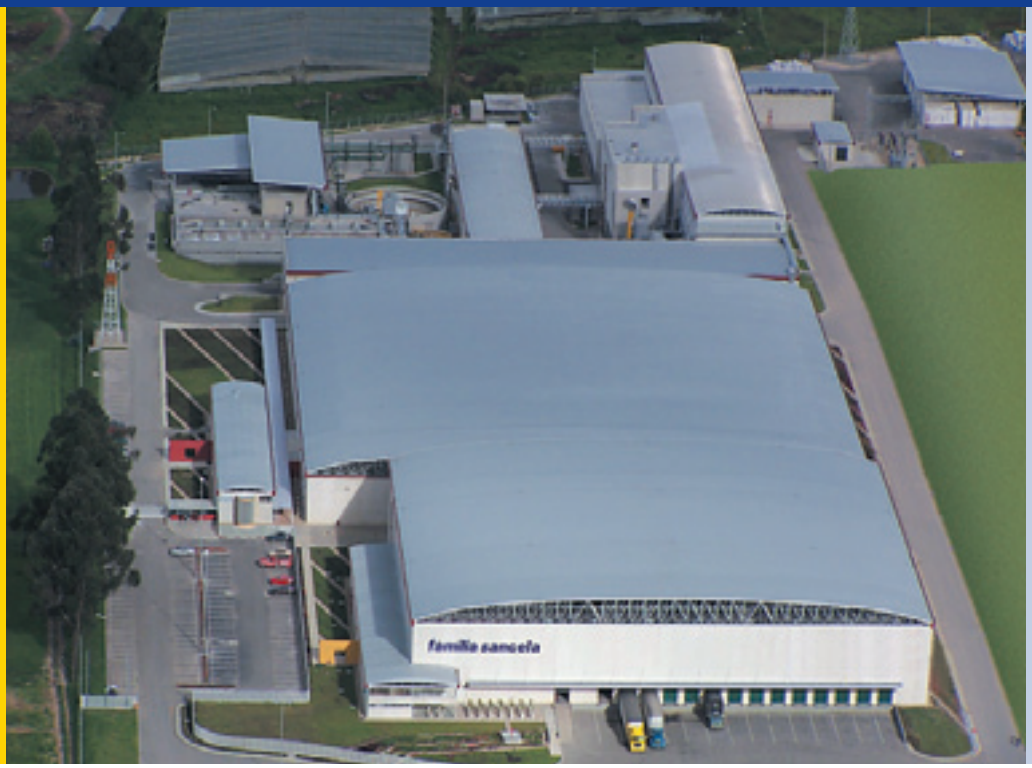
**Carilla:** The last months are always very activity-intensive. In any case, we managed to finish the installation and check-out activities without any injuries and two months ahead of schedule. Commissioning was also very fast, and we did not face any major problems. As the PM 10 design is based on that of our previous PM 9, all of us felt very familiar with the new PM, allowing us to be faster and safer.

This early start-up date means to us that amortization of the investment has started sooner, at a time when the rising energy and raw material prices make life more difficult for producers of board. For our customers, this has been another example of SAICA's reliability. Rolls of paper ready on the truck for delivery from the very beginning!

**twogether:** SAICA is Spain's largest privately owned producer of corrugating medium and liner and nearly hits the two-million tons bordert. What does the future hold for SAICA? What are your goals?

**Carilla:** With the new PM 10, our installed production capacity is 1.9 million tons. We want to put another PM for 400,000 t/y into operation by 2010 and to keep our business growing. For us, as a partly integrated group, this means increasing our waste paper collection centers as well as corrugated board facilities.

**twogether:** Many thanks indeed for this interesting interview – and congratulations on your new production line!




*Productos Familia Sancela in Cajicá, Columbia.*

# Productos Familia, Columbia – Expansion in Tissue

**Productos Familia Sancela, a partner company of the globally renowned tissue producer Svenska Cellulosa (SCA), is a leading supplier of tissue products in Columbia and neighbouring countries. As part of its expansion strategy Productos Familia has built a new tissue mill in Cajicá, conveniently located near the capital city Bogotá where consumer demand is the highest.**

This comprehensive greenfield production facility is comprised of the tissue machine itself, the stock preparation line, some processing machinery, and a full complement of auxiliaries. Voith partnered with the customer right from the beginning of this project by carrying out tests at the Voith Brazil Process Technology Center for Tissue with Productos Familia furnish. The goal was to optimize the process in order to reach the desired tissue product characteristics and to optimize machine configuration taking into account the customer's specific production requirements. To this end tests were conducted with a wide variety of machine configurations.

The convincing test results from this fruitful teamwork led Productos Familia Sancela to entrust Voith in March 2004 with supplying the entire tissue production line. With a wire width of 3,585 mm and a design speed of

*The new Tissue machine.*

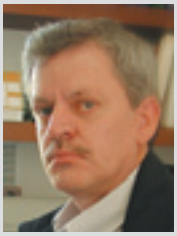
2,000 m/min, the tissue machine will produce up to 120 tons per day in a basis weight range of 15-25 g/m$^2$.

Among the main components of the tissue machine are a crescent former with 2-layer headbox enabling different stock qualities per layer for optimizing product cost and quality. The press section is equipped with a suction press roll, but already designed to accommodate a TissueFlex press later on if required. The Yankee cylinder diameter is 16 feet (4.8 m). A high efficiency dryer hood ensures optimally fast drying. The dust extraction system is fitted with active stabilizers. An ONP scanner installed by Voith Automation between the Yankee cylinder and reel measures and controls the basis weight profile and sheet dryness. The maximum parent roll diameter is 2,700 mm.

Voith's scope of supply also includes the stock preparation line for virgin pulp having a capacity of 120 t/24 h. This line is comprised of a make-down pulper for maintaining a coarse pumpable suspension, HC cleaners, refiners and agitators. The approach flow section includes screens, mixing pumps, agitators and broke pulper.

Thanks to the outstandingly good teamwork between Productos Familia and Voith, their meticulous commissioning planning, and efficient coordination of all the project participants both during execution and in the commissioning phase, the punctual start-up in September 2005 was very successful. This project has further extended the partnership already built up with other tissue producers with similar SCA Group affiliation and participation.

## Customer Comment



**Juan G. Gallon**
Productos Familia Sancela

"It is very important to uphold good synergy and teamwork between the customer and supplier right through the project. Due to the similarity of the Brazilian and Columbian cultures we enjoyed excellent relations with Voith in all phases of this project – engineering, manufacturing, erection and commissioning – both in technical and collegial respects. Also with regard to cooperation with engineering and commissioning supervision in other areas where Voith was not the main supplier, there was a high level of responsibility and trust between the partners. We are extremely satisfied with Voith's delivery and performance."

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*Premium tissue produced with the new Atmos technology.*


*Tissue pilot machine at the Voith Process Technology Center in São Paulo.*

# Atmos – Innovative technology for premium tissue production

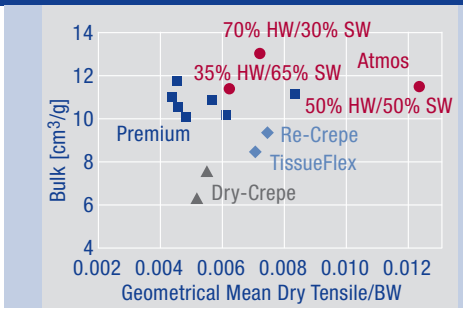
**This article gives readers a preview of our completely new technology development for premium tissue production. Within the next few months Voith will be launching this innovative technology under the brand name "Atmos".**

Atmos technology was developed at the Voith Tissue Process Technology Center in São Paulo, Brazil in close teamwork with Voith Paper Fabrics. This joint achievement shows once again how much our customers benefit from synergies between the various divisions of Voith Paper – truly a "Powerhouse"!

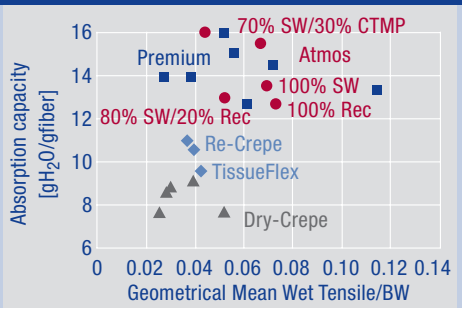
Premium tissue is distinguished by its outstanding physical properties compared with products made on conventional tissue machines. It meets the highest demands for bulk, softness and water absorption.

For more than thirty years premium tissue has been the domain of large tissue producers using through air drying (TAD) technology. With this technology the formed sheet is mainly dried by hot air, without any mechanical pressing, in order to ensure premium tissue quality by avoiding negative effects on sheet characteristics.

According to tissue producers, the drawbacks of TAD technology are the high investment expenses and the high production costs due to very high energy consumption. That is




*Toilet paper bulk characteristics.*




*Water absorption characteristics of kitchen towel.*

why only the largest companies were willing to use this technology.

Voith, therefore, made the strategic decision to develop an innovative technology that would enable premium tissue quality while eliminating the TAD drawbacks.

By far the greater volume of tissue production today comprises so-called classical grades such as toilet papers and kitchen towels. The most important physical quality requirements are bulk, hand-feel and structural softness for toilet paper, and water absorption for kitchen tissue.

Tissue paper characteristics are generally expressed in terms of dry and wet strength as a function of basis weight. Figures above show the volume characteristics of toilet paper and the water absorption capacity of kitchen tissue for the three main product grades currently available on the market:

- Dry-Crepe: standard tissue machine product quality.
- TissueFlex and Re-Crepe: improved tissue quality produced on the Voith TissueFlex shoe press machine and an additional quality produced on tissue machines with two yankee cylinders.
- Premium: the best tissue quality, produced so far with TAD technology.

As shown in figures above, Atmos product quality is very clearly in the premium sector, even if secondary fibers are used.

Our Atmos line with a 5,500 mm diameter yankee cylinder and a 500 °C dryer hood attains operating speeds of 1,000 to 1,500 m/min, depending on basis weight, furnish and product.

Compared with TAD technology, Atmos technology has the following advantages for premium tissue production:

- It enables the use of 100 % secondary fiber, still maintaining the premium tissue quality and speed of commercial TAD machines.
- Up to 40 % less capital investment costs because of less required machinery, reduced erection, manufacturing and building costs.
- Dry-Crepe tissue machines can be retrofitted with Atmos technology for operation either in yankee cylinder mode, or in Atmos mode (Swingmachine), if required by premium tissue market developments.
- Up to 30 % lower energy costs, and 35 % lower overall costs for operating materials (stock, chemicals), labour, fabrics, maintenance, and auxiliaries.
- User-friendlier operation, and higher productivity.

The first Atmos line is being anonymously installed in a customer's mill strategically selected according to a Voith market survey. Commissioning is planned for the third quarter 2006.

Further details of Atmos technology will be reported in a forthcoming edition of twogether magazine.

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# Faster quality tons on the reel – Turbo-upgrade of Perlen Papier's LWC PM 4 "Pioneer"

**PM 4 "Pioneer", the first online-calendering paper machine delivered by Voith Paper to Perlen Papier AG in Switzerland for LWC offset printing grades, started up in October 2000. It not only met all expectations immediately, but also lived up to the Voith slogan "Engineered reliability" so well that already in 2004, Perlen Papier decided to increase the production capacity of PM 4 from 160,000 to 200,000 t.p.y.**

To this end the operating speed had to be raised from 1,300 m/min to 1,600 m/min, which was no problem thanks to the drive power reserves built into PM 4 right from the outset by Voith. Perlen Paper was not only interested in higher output, however, but also in upholding quality at the same time. In other words: faster quality tons on the reel. That was quite a challenge, because speed increases on such machines are normally at the cost of gloss and smoothness. Which is why Perlen Papier asked whether Voith could actually break this vicious circle. To put our readers at ease: it goes without saying that once again, Voith solved the problem! As explained below, this was done by adopting two approaches: process technology on the one hand, and machine design on the other.

## The process technology approach

Although gloss is so important for calendering LWC grades, until 2003 there were only three ways of controlling it: by varying the

- temperature,
- pressure, and
- number of nips.

During 2003 Voith succeeded in identifying an additional gloss control parameter: extensive trials on the Janus MK 2 calender test facility in Krefeld proved that with a revolutionary new remoistening system, gloss could be improved by up to 4 points. This opened up a way of compensating for gloss reduction due to speed increases, but first the problem had to be solved of maintaining the necessary FlexiTherm roll surface temperature despite additional heat losses due to remoistening and higher speed.

The simplest solution would have been to increase the thermo-roll feed temperature of the online Janus MK 2 calender in Perlen, but the existing oil heating system capacity was too low. It was designed for a feed temperature of 235° C, and in any case, the rolls would have been overloaded under such conditions. Installing the Voith FlexithermCoil inductive exterior heating system solved this problem. Originally designed as high-performance external heating for NipcoFlex calender rolls subject to extreme thermal loading, this system also served in Perlen for increasing the installed capacity of heated rolls while at the same time ensuring


*JanuLock in the open and closed positions.*

## Customer Comment

**Franz Graf**
Perlen Papier AG

Faster quality tons on the reel was certainly an ambitious goal. It is of course up to the customer to say whether this goal was reached. So Franz Graf of Perlen Papier AG has the last word:

"Only five years after PM 4 started up we decided to increase our LWC machine capacity by increasing the speed. This was done in two phases, involving substantial rebuilds above all of the press section, the coater and the Janus calender.

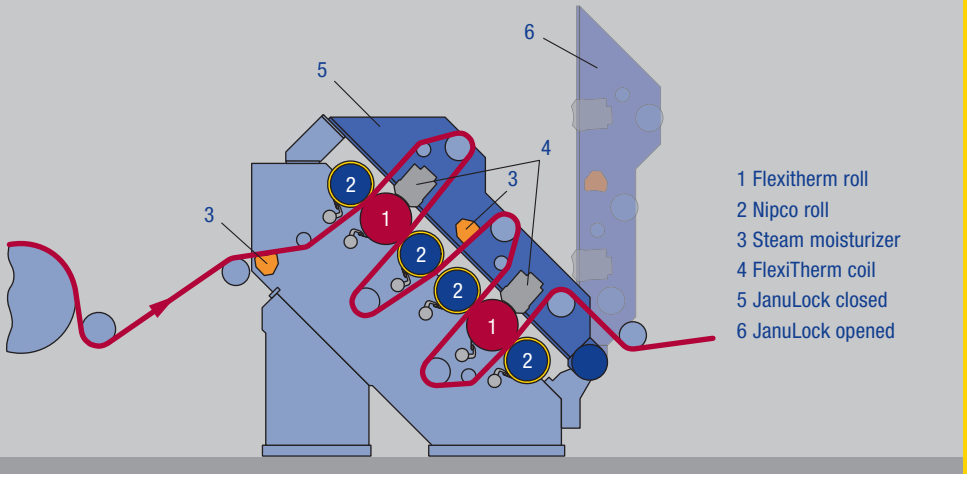
We had found so far that Janus calender roll changing accounted for a good deal of shut-down time, because everything installed above the calender first had to be dismantled. By adding further components such as a steam blow box and two induction heaters, the capacity increase rebuild would have exacerbated this problem. In order to avoid longer roll change times in future, we agreed with Voith to install a JanuLock system. This framework on which everything above the rolls is mounted can be quickly lifted by hydraulic cylinders for easy crane access, so that no time-consuming dismantling work is require prior to roll changing. In fact the JanuLock makes roll changing considerably faster despite the additional post-rebuild installations. The user-friendly swivel mechanism opens and closes in only ten minutes, and the rope tensioning station has been modified so that threading rope loosening or release is unnecessary.

Right from the outset, our JanuLock has proved a good investment. Over the last three months it has saved our maintenance crew a lot of roll changing work and above all time."

dependability. The FlexithermCoil heating system comprises a specially designed inductor bar that applies additional heating to the roll precisely where it is needed: on the roll surface and immediately below to a depth of only a few millimeters. The big advantage is that this additional heat increases and decreases immediately, and that the temperature distribution in the thermorolls is almost homogeneous. The result is far more dependable roll operation despite greater heating and higher surface temperature.

The following figures show how well this goal was reached:

- 20% more heat transfer from hot rolls to paper
- 30% better roll dependability at the same time.




*JanuLock layout.*

The process technology approach, therefore, brought a promising solution in 2004. It involved retrofitting the following components to the PM 4 online Janus MK 2 calender:

- Two steam blow boxes,
- Two FlexithermCoil heaters, and
- New components for a redesigned ingoing web run.

It turned out, however, that installing these additional components in the existing calender would not be easy at all: clearly the machine design would have to be revised as well.

## The machine design approach

In their search for the optimal machine design, the Voith engineers were able to draw on positive recent experiences with their innovative DeltaLock system for the EcoSoft calender. It was “only” necessary to adapt this concept to the Janus MK 2 calender. The result they came up with was the JanuLock, a lever system integrated in the calender frame. On the operator side and on the drive side of the calender a 7-meter long swivel arm is installed above the roll stack. A crossbeam joins the two arms at top and bottom. This swivelling platform carries all exterior components such as rolls, spreader rolls, inductor bars, steam blow boxes, drives, supply piping including oil lubrication components, etc. For roll changes the entire assembly is retracted to give immediate crane access to all the calender rolls. The JanuLock is opened and closed by hydraulic cylinders on tender and drive sides respectively. The two JanuLock arms are synchronized by a sophisticated hydraulic control system. This also ensures a constant opening or closing speed at all times despite reverse loading when the levers pass through the point of equilibrium. Opening and closing takes less than ten minutes. The results of JanuLock installation on the PM 4 Janus MK 2 online calender are impressive: it now takes only three hours to change a FlexiTherm roll, instead of six hours prior to rebuild.

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# Dresden Papier – optimized threading process cuts threading time in half

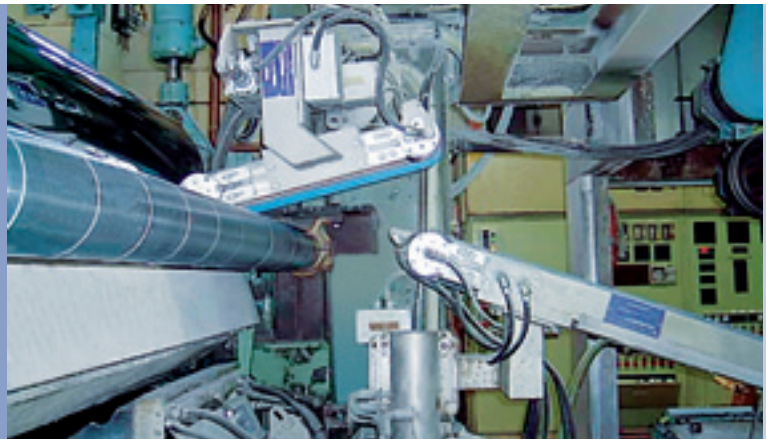
**The web threading process at the Fährbrücke mill of Dresden Papier GmbH was radically improved after consultation with the experts of the Voith Tail Threading Group (VTTG) and an extensive threading process audit by TEAMS (Threading Evaluation and Managed Solutions). Threading is now consistent and takes less than half of the previous threading time.**

Dresden Papier's Fährbrücke mill was experiencing problems with their threading process. They needed expertise to help identify the exact problems in the process and create solutions for solving these problems. Voith TTG was chosen for this task based on experience, good references, quick delivery times and efficient manpower allocation. First, the mill decided to commission a full machine threading audit, TEAMS, from Voith TTG. During the TEAMS audit, two Threading Process Specialists examined the paper machine, threading equipment and existing threading processes. Current machine procedures and specific problems in the process were also discussed with the mill personnel.

Up to the calender section the original threading was done mostly with rope systems. The main problems found in these rope systems were long, unsupported rope runs, improperly installed rope sheaves and inefficient rope stretcher operation. The dryer through calender to reel section was originally threaded with an air

*Threading controls at Dresden Papier, Fährbrücke mill.*

*VTT Turbo conveyors installed in the end section at Fährbrücke mill.*



tray system. This threading method resulted in inconsistent threading performance and excessive threading times.

In addition, the original system at this section tended to allow the paper to ball up and damage the closed nip calender roll covers, as the paper would jam going through the calender. Occasionally the damage was so extensive that the whole calender roll needed to be replaced. The time lost with threading combined with non-recyclable product and calender roll damage ensured a fast payback for any potential threading optimization.

After the audit, a specific report detailing all the findings and improvement suggestions was created and sent to the customer. Using the TEAMS report as a road map, Dresden Papier started optimizing the threading process at Fährbrücke. The mill started with the recommendations for improving the existing rope threading systems. Small improvements were made throughout the rope systems to improve efficiency. Even though sometimes small, when all rope system changes were implemented at the same time, they had a significant positive impact on the threading efficiency.

The section from dryer 42 to the reel through three open nip calenders was determined to be the section that most needed full optimization. The tail transfer at this location was optimized using three VTT conveyors. The VTT Turbo conveyors were installed with a Flip Tray to stabilize the tail and transfer it from the dryer onto the first conveyor and a Tail Ripper to eliminate the double tail. In addition to the VTT Turbo conveyors, calender shoes and a reel threader were installed to provide optimum threading performance. All of the equipment was installed on linear tracks to allow threading with different sheet widths.

The Fährbrücke mill is still working on implementing some improvement suggestions that were made in the TEAMS report. However, threading time has already been reduced by half, based on only the upgrades done so far (one automated VTT transfer section and rope system modifications).

## Customer Comment

**Dr.-Ing. Ulrich Paris**
Central Technology Manager
Dresden Papier GmbH

"Dresden Papier is extremely happy with the results of this optimization. Of all the projects we were implementing at the same time, the threading optimization was the 'smoothest'.

Positive results at the Fährbrücke mill encouraged Dresden Papier to implement another TEAMS audit at the Heidenau mill, Germany, to optimize the threading process at this location as well."

## Contact

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# Higher output at Dresden Papier and enhanced product quality at the same time

**On PM 4 at its Heidenau mill Dresden Papier GmbH, Germany, produces coated duplex and non-woven wallpapers, as well as coated and uncoated laminating papers with basis weights ranging from 70 - 160 g/m². Last year the maximum operating speed of this 3,400 mm wide machine was 320 m/min, depending on grade, and Dresden Papier wanted to increase it. While the drive systems would have handled a speed increase without problem, it was very doubtful whether the installed drying capacity would still have been adequate.**

To clarify this situation, Dresden Papier contacted Krieger GmbH & Co. KG, Mönchengladbach, a leader in non-contact drying technology and since 2002 a majority holding of the Voith Group.

Dresden Papier had already consulted Krieger in a similar case previously, with excellent results thanks to Krieger's several transportable test facilities for precisely checking out drying capacity increases on site.

## The approach

The Krieger experts tackled their task in three stages:

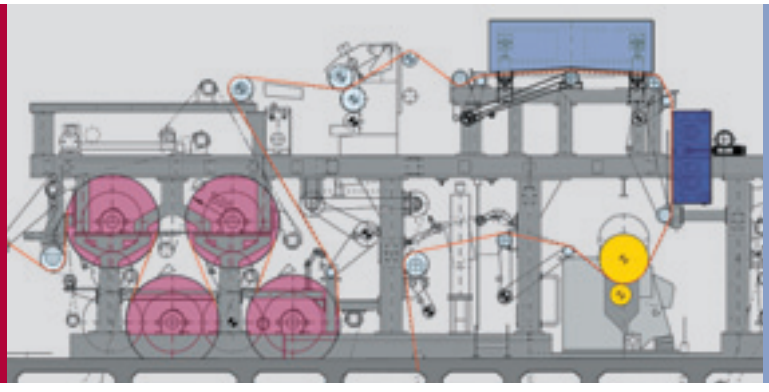
- First, a meticulous examination was made of the existing drying conditions.
- Secondly, the resultant data was converted into a computer model enabling simulation of all the feasible drying solutions.
- And finally, the optimal solution for PM 4 was worked out with Dresden Papier based on the simulation model.

## The solution

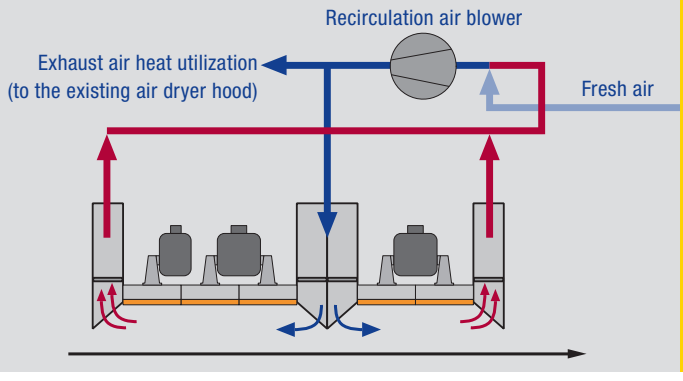
Taking account of the planned speed increase, use of higher grammage coatings and extension of the non-woven wallpaper product range, the optimal solution was to replace the existing IR dryer with a more powerful Krieger InfraAir drying system.

Furthermore, to increase overall drying efficiency, the exhaust air from this new system will be fed to the existing downstream air dryer.

*PM 4 layout.*



*Air dryer system.*



*Dresden Papier Heidenau mill.*

At the end of September 2005, Dresden Papier assigned Krieger with the PM 4 rebuild accordingly.

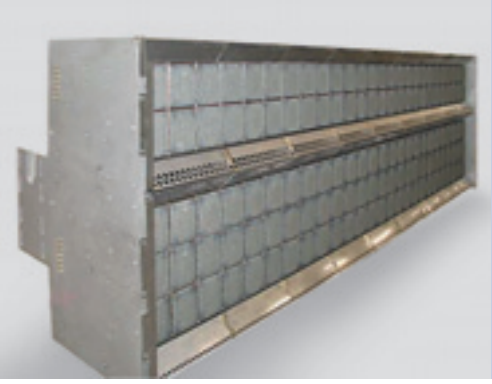
The scope of rebuild comprised the delivery, installation and commissioning of a Krieger InfraAir drying system with gas-heated K10 000 ceramic infrared emitters in one triple and one double row, each between blower and vacuum ducting. The circulation air serves for adequate web ventilation as well as for combustion gas and water vapour extraction. All the process-relevant parameters can be adjusted on a local control panel providing an excellent overview. The gentle drying required for coated non-woven wallpaper is also assured by the integrated power control and circulation air temperature control.

Safety systems for fire prevention and extinguishing round off the scope of supply.

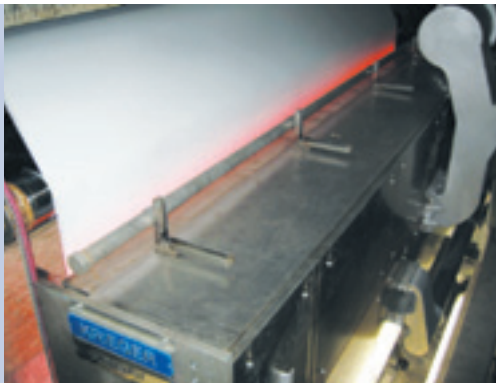
## Project management and execution

The contractual deadlines were critical because the upgraded machine already had to be on line again in the first week of 2006. Punctual compliance with this ambitious schedule was due not least to the outstanding cooperation between the partners. Over the Christmas break they dismantled the old IR dryer, installed the new one and connected it to the existing air dryer, and recommissioned the entire system so that PM 4 was able to start up again in the first week of 2006 without problem.

*InfraAir dryer prior to installation.*



*InfraAir dryer after installation.*



## Customer Comment

**Dr.-Ing. Ulrich Paris**
Central Technology Manager
Dresden Papier GmbH

Dr. Ulrich Paris, Central Technology Manager at Dresden Papier GmbH, took this punctual restart and subsequent performance verification as an opportunity for issuing a press release from which we would like to cite the following extract: "This modern drying installation is not only able to dry coatings with a higher grammage, but also helps to increase PM 4 output and optimise product quality. The agreed performance targets were met in next to no time."

Many thanks Dr. Paris for your "well done Krieger!" praise, which gratifies us all the more because this is the second time Dresden Papier has paid tribute to Voith – see article on page 64 of this issue.

And for readers asking the ROI question – "What is the payback time on this investment?" – Dr. Paris also has the answer: "We reckon the Krieger IR dryer rebuild will pay for itself in about one year, particularly in view of the speed increase it enables in non-woven wallpaper production".

## Contact

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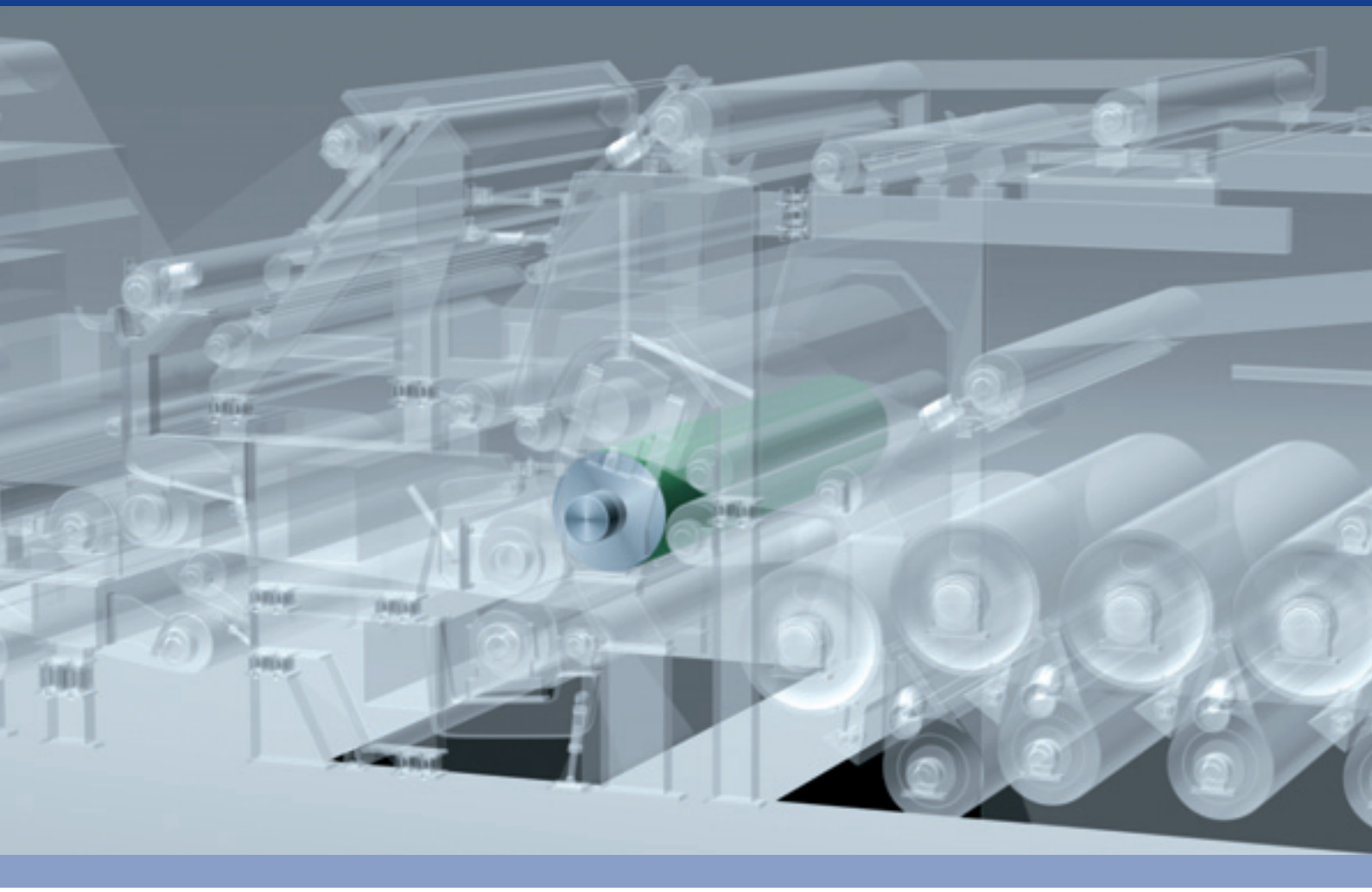


# TerraSpeed – the new generation of ceramic coatings for press rolls

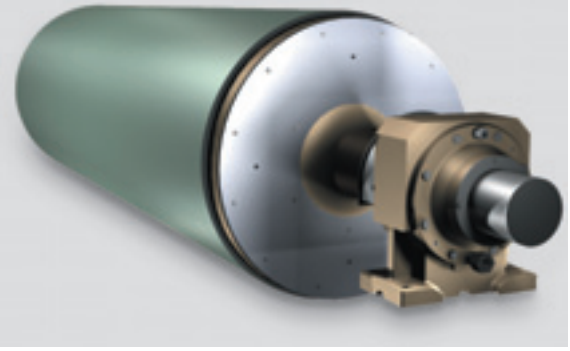
**Recent developments in the paper industry result in increased demands on paper machines. Larger machine components and higher machine speeds set new requirements regarding the functionality of roll surfaces.**

In the press section, Voith Paper Rolls' CeraLease set the standard World Wide for ceramic coated press rolls. The culmination of all our experience, improvements, and developments was the basis for the development of the new standard in ceramic coating: TerraSpeed.

## The function of the center press roll

Since the inception of paper machines more than 100 years ago, the central press roll position is considered as heart of the machine. There, the before formed sheet touches a

roll surface for the first time. In the nip of the central press roll, the majority of the residual moisture is pressed out of the sheet. After the press nip the paper will be drawn with the respective elongation from the roll surface and then transported with a resulting speed difference further on through the machine. This tension difference can have a remarkable effect on the speed and efficiency of a paper machine. If the sheet can not easily be released from the roll surface, it will overstretch and break.



*Central press roll –*
*the heart of a paper machine.*

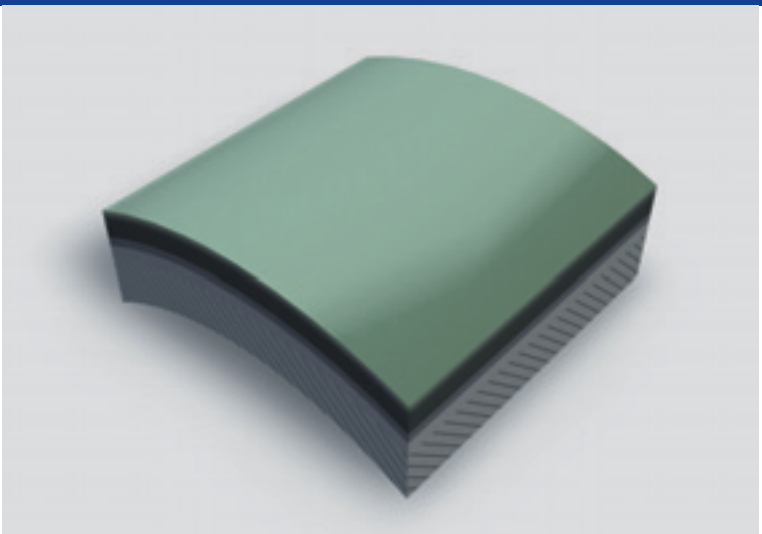
The situation is similar for single-nip presses, which are also, according to paper grade, being used in modern One Platform Concept machines.

For several decades, paper makers considered the naturally structured granite roll as the optimal solution for the central roll position. The high hardness was a guarantor for best abrasion resistance. Granite's structure with different phases was the basis for best sheet release. The differences in hydroscopy between the phases generate micro-turbulences which fostered sheet release.

The affinity of granite to silicate deposits is one of the material's shortfalls. The rolls became contaminated sheet tension increased, and the rolls had to be ground. The usage of steam showers, greater loading, and higher machine speeds finally showed the severe limitations of granite. The sensitivity of granite in demanding environments resulted in its decline in the paper industry since the end of the 1980s. Cast iron rolls and steel rolls were covered with various functional surfaces made of different materials. First approaches with rubber or filled resin are still used but not suitable for the fastest machines. The crucial breakthrough was managed with plasma-sprayed oxide ceramics that remarkably outperformed granite's properties. A tailor made surface topography enables best sheet release while taking paper grade, machine speed, and other specific characteristics into account. Compared to granite rolls, sheet tension can be reduced by up to 50%. While granite rolls sometimes had to be ground several times a year, a ceramic roll's hardness and strength allow running times of several years, even under the toughest chemical and mechanical conditions. Although better performing than granite the first ceramic covers suffered from silicate contamination, caustic attack, and corrosion.

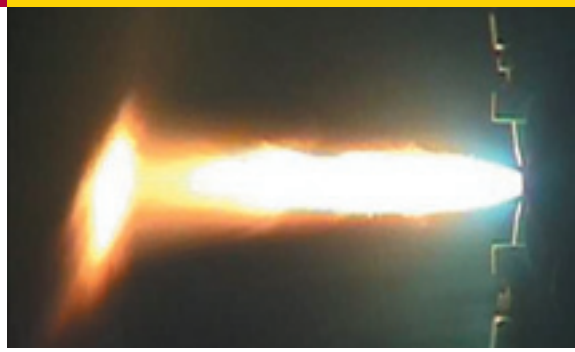
A next major step in technology came with the introduction of CeraLease the most successful ceramic coating in the industry. More than 800 installations in the paper industry speak for themselves. The undisputed advantages of the high-purity single phase oxide ceramic are the fundament for numerous advancements in the Base-Layer that improved durability and corrosion resistance.

Voith reviewed the performance of ceramic center press rolls with hundreds of years of accumulated running time and the latest developments in coating technology. This helped to direct the research and development of a new generation of coatings. The culmination of this development is TerraSpeed, the next generation ceramic cover.



*TerraSpeed –*
*a combination of 3 layers.*

*High quality top functional layer structure.*



## TerraSpeed

TerraSpeed is the latest ceramic coating for press rolls with paper contact. The TerraSpeed coating is applicable in the production process of all paper grades and is characterized by a combination of mechanical, chemical and technological characteristics which surpasses all current application limits.

TerraSpeed is a combination of three layers. The top functional layer consists of the well proven high-purity oxide ceramic with a specific surface treatment. New approaches of powder production and optimized plasma coating techniques allow an even more efficient and higher quality top layer composition. Recently developed surface systems make it possible that the surface is kept clean for a long time, even in chemically demanding production surroundings.

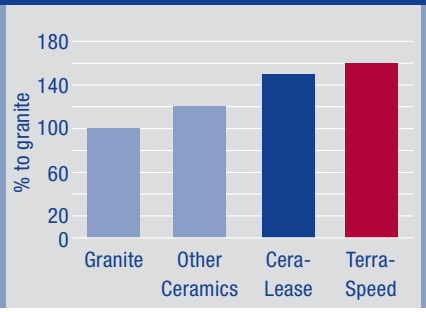
The barrier and bond layers were optimized by customizing e-moduli and material combinations. While the bond layer provides a basis for optimal bond between ceramic and metal, the very dense but nevertheless ductile barrier layer offers adequate corrosion protection (even if pH < 4) and improved bond to the roll core.

Recently developed methods for post processing the thermally sprayed TerraSpeed coating improve the coating's shape accuracy.

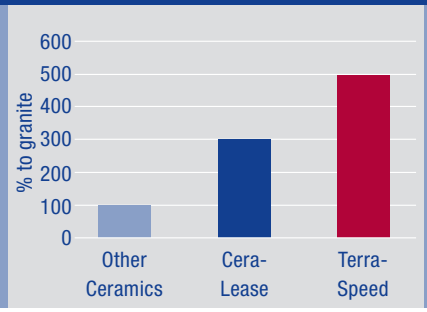
The adjusted micro-hardness of about 1,300 HV with various strengths in the different layers and confidentially adjusted porosity of the functional layer determine TerraSpeed's outstanding properties.

An optimized cover thickness of 0.8 mm offers the paper makers a good compromise between excellent functional properties, adequate operational reliability, and more potential for regrinds than any competitors' current offerings.

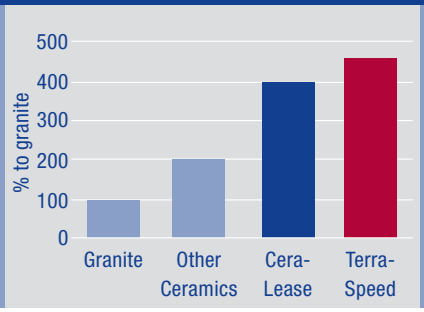
TerraSpeed offers best sheet release, best abrasion resistance, and highest continuity over long running times. These advantages are designed into the cover for all paper and board grades, press configurations, roll positions, chemical/mechanical exposure or stock quality. Thus, the paper maker's essential needs are not only fulfilled but even surpassed.




*Relative sheet release.*




*Relative Abrasion Resistance.*




*Relative Running Time.*

## Performance TerraSpeed

A step-by-step product development and numerous field trials have uncovered TerraSpeed's potentials. In high speed applications like newsprint production, the "open draw" is no longer a bottleneck if TerraSpeed is used. Even if the machine speed exceeds 1,600 m/min, the tension difference in the central roll position can be kept (depending on the operating conditions) to a minimum for years. Highly filled decor and SC papers can be dewatered with TerraSpeed for long periods without deterioration of the press roll surface. The use of tungsten carbide-coated steel blades is allowed and offers the possibility of extended blade life and extremely efficient doctoring of the surface. Organic and inorganic deposits are strongly reduced by designing the cover surface as a system that is matched to the demands of the furnish in harmony with the doctoring, showering and other physical properties of the nip. Another example is the coating base paper production process. There, the press roll surfaces are sensitive to deposits due to the coating surplus in the broke cycle. The opportunity to intensively doctor the TerraSpeed coating leads to unique performance improvements. In the production of all board, liner, and packaging qualities, the low quality of recycled paper results in severe abrasions, especially in the press nips. In this context, TerraSpeed configured for these applications is clearly superior to past rubber products. If special paper grades like light weight cigarette paper and banknote paper are produced, paper makers benefit from the outstanding combination of sheet release and wear resistance only TerraSpeed offers. Moreover, TerraSpeed even proved its worth in specific raw material (e.g. cane trash) processing.

## The future of the press roll

In the development of TerraSpeed, Voith Paper combines advances in modern production technology and material processing with their years of experience in the thermal coating of paper machine rolls. The total combination of Voith Paper's various competences made it possible to set a new standard in the thermal coated press roll cover design. The development of TerraSpeed was possible because of Voith Paper's complete engineering and paper production process competence. Only the numerous findings that have been gathered over years in close cooperation with the paper makers made the launch of the TerraSpeed coating possible. TerraSpeed will significantly determine future press roll performance. The many nonlinear factors that have to be considered when working on solutions for the press roll position were analyzed and taken into account in the development of TerraSpeed, a coating fulfilling customer expectations.

Thus, TerraSpeed allows cost saving performance improvements, in slowly running specialty paper machines and in highly abrasive board and packaging production processes as well as in high speed graphic and newsprint paper machines.

**Contact**

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Rolls
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# Service Seminar in Finland – Record attendance

**Judging by the number of people attending Voith Paper Oy's service seminar, Finnish papermakers are very keen to know about Voith's latest developments in paper technology. More than fifty paper mill maintenance and service specialists met at the end of January 2006 with Voith experts in Helsinki. The 1-day interactive seminar included diverse presentations not only on Voith service but also on Voith's roll cover innovations.**

Guests were welcomed by Jouko Jokinen, Managing Director Voith Paper Oy, who was gratified at the presence of so many paper industry partners: "We never thought this seminar would be so popular. Many thanks to all of you for taking the time to come. We are certainly going to have an interesting day, and I am all the more gratified to see here so many experts interested in Voith."

Mr Jokinen started the seminar by giving a brief historical overview of Voith's activities in Finland. When Voith Paper Finland was founded in 1997 the company only had five employees. Today Voith has three companies in Finland: Voith Paper Oy, Voith Paper Fabrics Oy and PikoTeknik Oy. And the number of employees has risen from five to 75: 14 at Voith Paper, 10 at Voith Paper Fabrics and 51 at PikoTeknik.

"Since company operations started in 1997, we have delivered eleven shoe presses and several coating lines amongst others. Our latest project, worth more than 50 million Euros, is a complete rebuild of PM 3 at Stora Enso's Veitsiluoto Paper Mill", he reported.

The seminar focused in the morning on PikoTeknik activities and the new roll coatings. Ingmar Vesterlund of PikoTeknik Oy informed everyone about the new generation of cylinder and roll coatings, while Jouko Niinimäki, Dr. eng., of Oulu University explained the dirt deposit mechanisms on drying cylinders. Dr. Michel Beltzung of Voith Paper Rolls then presented Voith's new Elastomer coatings.

PikoTeknik Oy specializes in hard surfacings. The most important of these is PikoClean, now used as standard coating in all new Voith paper machines (see twogether 19 and 21).

# Excellent response

**Just what we had hoped for – and our hopes were far exceeded! The twogether editorial team, authors and producers tender their sincere tanks to all those readers who took time to participate in our Internet survey as requested in twogether 19.**

It is now more than ten years and 21 editions since this Voith Paper customer magazine was first published – as well as a number of special editions devoted to various products and countries. During this time total circulation figures in several languages have more than tripled – reflecting the high interest in our articles. Besides that, other specialized journals at home and abroad publish reprints taken from each edition.

The popularity of twogether magazine is primarily due to our ongoing reporting on innovative technical developments and their successful implementation. “I know of no other journal to which I can attribute so much useful information for my work”, writes one of our regular readers. Although we receive many such letters, we shall not rest on our laurels by any means – criticism and suggestions for improvements are always welcome. In this edition, for example, we have tried to improve the layout and arrangement of twogether magazine.

Why are our contributions so highly regarded? Primarily because they are authored by everyday practitioners. And twogether magazine pays tribute for this to the Voith Paper engineers and technicians who take time to report on their work in research and development, project realization and customer support.

We also pay tribute here to our customers, whose articles and commentaries play a key role in upholding the quality of twogether magazine. Despite heavy workloads and responsibilities, they too find the time to make their contributions. We would, therefore, like to pass on all the thanks we have received from our readers to every single one of our authors. It is they as experts who provide the solid foundations of our customer magazine.

And last but not least, we heartily congratulate the three principle prize-winners who took part in our reader survey. We wish Klaus Gödrich of LEIPA GmbH, Schwedt, Germany, a wonderful weekend in the Black Forest, and we hope Ismo Rossi of Sappi Tugela, South Africa and Beatrice Alm of Holmen Paper AB, Hallstavik, Sweden will also have a lot of fun with their prizes.

“We recently started looking hard for new coating materials, while at the same time developing new properties for the materials we already use. We are making good progress with this work”, said Ingmar Vesterlund, “and we are very lucky to be located in Finland as far as thermal coating is concerned. Six people here chose thermal spray coating as their doctorate thesis, and there are two faculties at Finnish universities conducting research in this area. That makes our development work much easier – there is no shortage of help and support!”.

The afternoon was mainly dedicated to Voith maintenance and repair services. Discussions centered on ceramic coatings for central rolls, paper roll rebuilds, and the operating characteristics of Voith machinery in the pre-drying zone.

This busy day concluded with a visit to a tough ice-hockey match between two Finnish league teams from Helsinki. Exciting as it was to see the best team win, participants seemed to enjoy at least as much the time they spent together at this interesting seminar.

# Voith Maxima® 40 CC – Crossing new frontiers in traction power

**Voith Turbo's new locomotive – A breakthrough in diesel-hydraulic traction**
**Rather than just traction components, Voith Turbo now offers a complete locomotive for the first time. The Maxima 40 CC 6-axle diesel-hydraulic mainline locomotive is designed both for hauling heavy freight trains at speeds up to 120 km/h, and for high-speed passenger transit up to 160 km/h. By developing and manufacturing the Maxima locomotive at the newly founded Voith Turbo Lokomotivtechnik in Kiel, Germany, Voith Turbo demonstrates that diesel-hydraulic traction has a very competitive future in the high-performance sector as well.**

It is an ongoing challenge these days for transport companies to safeguard their market shares in face of growing competition for freight transit worldwide. In particular the rail freight sector needs more cost-effective and innovative concepts, both with regard to operations logistics and traction technology.

The Maxima 40 CC is powered by the Voith Turbo LS 640 re turbo-split transmission with up to 4,200 kW gearbox input. Based on the existing family of cost-effective hydrodynamic transmissions, this new system puts Voith Turbo in a completely new hydrodynamic drive performance class.

Imminent completion of the Voith Maxima 40 CC will provide operators with Europe's first catenary-independent locomotive in this performance class. It opens up more cost-effective transport and operations possibilities not only by eliminating the need for locomotive changes between electrified segments and different power supply systems, but also thanks to its high traction rating and adhesion. This innovative development, based on highly effective application of the Voith hydrodynamic drive concept, illustrates the enormous potential of this ideal rail traction technology.

The Voith Maxima 40 CC will debut in September this year at the Innotrans international rail engineering trade fair in Berlin.

*Voith Turbo is a Voith Group division specializing in hydrodynamic drives, couplings and braking systems for road and rail, marine and industrial applications.*

# Voith Industrial Services

The industrial sector faces ever increasing pressure to develop innovations while keeping costs as low as possible. As a result, companies are forced to work more efficiently, economically and flexibly. In times like this, it is good to have a strong partner who can provide comprehensive services, allowing your company to focus on the essentials.

Voith Industrial Services offers you a unique combination of process and facility services from one source – with the two complementary competence areas, Process and Facility.

The Process competence area offers all services directly or closely linked to the production process: from planning, engineering, assembly and maintenance to the renovation and modernization of machines and systems.

The Facility competence area covers all location-related services: from overall facility management and the cleaning of technical systems to maintenance – across all industry sectors.

In order to provide the optimal service for your requirements, Voith Industrial Services relies on the combined power of strong brands. Voith and Hörmann are the specialists for process services, an area in which industry-specific know-how is essential. DIW and Premier have made names for themselves as experts for location-related facility services.

The comprehensive coverage of Facility and the clear industry orientation of Process enables Voith Industrial Services to offer all services you need for your production facilities and plant infrastructure – wherever you are in the world.

*Voith Industrial Services, a group division of Voith AG, counts as one of the leading providers of technical services for the key industries. With more than 150 business locations worldwide and over 15,000 employees, it posts sales of about € 700 million in 2006.*

# Voith Siemens Hydro

Voith Siemens Hydro Power Generation has been awarded a contract by E.ON Wasserkraft for supplying equipment for the modernization of the Waldeck I pumped storage station. E.ON Wasserkraft is going to invest € 50 million in the hydro power project located in Germany's federal state of Hesse. The contract value for Voith Siemens Hydro runs up to € 24 million.

The overall technical concept – from structural to electro-mechanical design – was elaborated by Voith Siemens Hydro in close cooperation with Bilfinger Berger. While Bilfinger Berger will execute the civil works for the new complex Voith Siemens Hydro will be responsible for the supply of a new reversible pump turbine with 74 MW turbine output, motor-generator, shut-off valves, start-up converter, transformer and process control.

*Voith Siemens Hydro Power Generation is a Group Division of Voith and – with a workforce of around 2,600 employees and sales of € 600 million in the past business year – it belongs to the worldwide leading companies for hydro power equipment.*

# Green turf, beautiful game and lots of paper

**The object of desire is as green as a soccer field, only a few grams in weight, the size of a postcard and entitles you to share the passionate atmosphere at the biggest sports event in 2006: a ticket for the 2006 Soccer World Cup. A total of approximately 3.3 million tickets are being produced according to state-of-the-art security standards in order to exclude any forgeries or black-marketing. But there are also countless other paper products all relating to the World Cup, which are making the German paper industry to flourish. At the start of the production chain are the paper machine manufacturers such as Voith Paper, one of the largest in the world.**

Anyone who has got hold of one of the coveted World Cup tickets on the open market can count themselves lucky, as there were roughly 40 million people applying for the internet quota of 1.112 million admission tickets that were on sale to the fans. According to current information from the German Soccer Association DFB and figures provided by the Bavarian broadcasting station Bayerischer Rundfunk, the entire quota of 3.37 million World Cup tickets is divided up as follows: 1.112 million tickets are sold directly to fans on the internet, soccer associations receive 783,000 tickets, and 440,000 tickets are available for media representatives and VIP guests. Sponsors and organisers will receive 688,000 tickets and the final quota of 347,000 tickets goes to corporate customers.

## Stylised La-Ola wave decorates the ticket

The lucky ticketholders will themselves only receive the admission tickets for the sports event of the year a few weeks before the first kick-off. Only then will the tickets be sent to the recipients. Only a handful of VIPs were allowed to get hold of a specimen of the coveted ticket months before the World Cup. At the official launch of the ticket by the World Cup mascot lion “Goleo”, exactly 100 days before the start of


*The object of desire – in paper.*

the World Cup, the thing that people liked most about the grass-green ticket was the stylised wave, which is supposed to be reminiscent of the typical La-Ola wave of enthusiasm in the stadia. To ensure that tickets are as forgery-proof as possible, an ingenious mix of security standards has been implemented.

Forgery-proof tickets – what does this mean? Firstly, the tickets have an invisible electronic chip embedded into the paper, which stores the personal data of the ticketholder. And it is precisely this chip that is used for access into the stadium. You will only be allowed to go through the turnstile into the stadium if you have a ticket with a valid chip. Secondly, the paper is embossed using a state-of-the-art production technique and is unmistakeably marked with a printed-on bar code. The thermal printing process used ensures optimal display of the bar code. Additional copy protection is ensured by a printed-on shiny hologram. “I can vouch for the fact that the tickets can’t be forged”, said the OC Vice-President Wolfgang Niersbach.

**Whether fan guides or match programs, a lot of paper is being printed for the World Cup**

Yet the tickets represent just a fraction of the total amount of paper that will be used for everything relating to the World Cup. The paper industry will profit from the fact that many more paper products will be required – the tickets themselves play an almost secondary role in this respect. From official World Cup posters to stadium magazine, a vast range of printed products will accompany the fans.

In World Cup merchandising, paper products constitute a major aspect of the items available. With calendars, newspapers, books, games, audiobooks, quiz-books, posters, puzzles, stickers and much more besides, soccer fans can get in the mood for this massive event.

*Cards, games, calendars, posters, puzzles, art – all paper products to do with the World Cup.*


If you imagine a normal stadium visit, it will soon become clear how many products made of paper will be accompanying the fans into the stadium.

To help you find your way around town, special fan guides have been provided, including a map of the city, a ticket for local public transport and tips on where to go. The route to the stadium is accompanied by posters drawing attention to matches, soccer stars and sponsors. Once you arrive in the stadium, the admission ticket will allow access to the fans' paradise. First of all, all fans are given a match program, so that they can find out all about the two teams that face each other that day.

### Specially designed paper bags are particularly chic

So that the program doesn't get in your way, it comes with its own paper bag. And then away you go. After the whistle, the teams are spurred on by the cheering crowds, while young and old alike encourage their heroes by passionately waving paper flags.

At half time, the fans satisfy their hunger and thirst with sausages in paper napkins and beer in paper cups.

And after the World Cup? The paper industry does not stop there by any means – the most emotional moments, the most spectacular scenes in the game and the most memorable goals are recorded for posterity in books, calendars and programs or on posters. This is some sort of consolation for those who were unable to attend live and a treat for those who wish to indulge in memories. Having the Soccer World Cup in your own country is undoubtedly a major catalyst. The wealth of different qualities of printed products also reinforces Germany's position as a producer of diverse types of top-quality paper.

### "Countdown" paper is made by Voith paper machinery

A large volume of the paper for the World Cup has been produced by Voith paper machinery. Fans can now get in the mood for the big event through the launch of "Countdown", a program produced on the Perlen


PM 4, Switzerland – a Voith paper machine that specialises in the production of top-quality online coated program paper. Vast quantities of paper are also being used in merchandising for the sports event of 2006. For example, puzzles are being produced, which are stored in special boxes, again stemming from Voith paper machinery.

And who would have thought that art and soccer could enter into a fruitful symbiosis? Famous artists from the six FIFA confederations have embraced the beautiful game. The result is fourteen top-quality posters that were published in the context of the official art and culture program for the 2006 World Cup, artistically embracing the "soccer" theme with photographs, paintings or collages.

The impressive art posters are printed on PhoeniXmotion deluxe paper – a unique premium paper that is produced on the PM 2 at the Scheufelen Paper Company in Lenningen, Germany. "A deluxe print substrate for emotive messages at the highest level," is how Scheufelen Paper Company's Head of Marketing, Susanne Todorovic, describes the premium paper from the Voith machine.

# Voith Paper

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

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