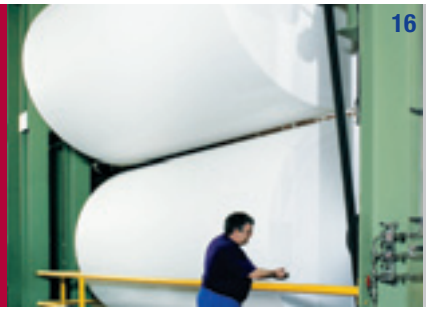


Report

New Plants

Germany
Land of Ideas
Official Partner

Rebuilds

Products

Service

R&D

News

Regular Features

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

Dear customers and other readers,

Looking back over a successful year 2007, we can be well satisfied. The delivered new production lines and rebuilds went into operation as planned and, after brief optimization phases, soon achieved their production targets.

The satisfying volume of orders also had a positive influence on our annual results. The bulk orders from the Board and Packaging division deserve a special mention in this respect.

The production of packaging for liquids at the new Klabin production line in Brazil has also started well. We would like to point out another aspect of the business here – sustainable forestry – a topic, which deserves as much attention as the impressive board machine. You can read more about Klabin's contribution on pages 4 to 9.

One of the reasons for our growth this past year has been the new "Voith Paper Air Systems" division. Not only are we using cooling and air technology in the paper industry, but the new division has also opened up new sectors such as food, textiles, beverages or tobacco. Please turn to page 68 of this issue for more information.

In order to better meet the needs of our customers in China and the Asia-Pacific region, we opened a new Technology and Service Center in Kunshan, China, at the end of the year. So far the first phase is complete, and the second phase will be completed by autumn 2008. By then more than 70,000 m^2 of manufacturing and administration area will be available in the so-called "Voith Paper City." Please turn to page 72 of this issue for more detailed information.

All in all, therefore, an eventful year is now drawing to a close. I would like to take this opportunity to wish you all a very Merry Christmas and a Happy New Year.

H. P. Sollinger

On behalf of the Voith Paper team

In the realm of the rainforest – sustain

able commerce and industry in Brazil

The new paper board machine from Voith on Monte Alegre is almost 240 meters long

There, where eucalyptus plantations and the primeval forest meet, environment and human impact are kept in a positive balance. Klabin S.A., a Voith customer, shows how closely economic success is linked to ecologically and socially sustainable business management.

In some industrialized countries, Brazil is often regarded as the epitome of unchecked overexploitation of the environment. Typical examples that may be cited include brutally slashing and burning the Amazon rainforest and recklessly using mercury and other in precious metal extraction using toxic substances. There is no doubt that some environmental crimes are committed in the largest South American country. However, with such one-sided views, it is often forgotten that Brazil is leading the way for both environmental protection and sustainable development in many areas. Just think, for example, that the majority of motor vehicles registered in Brazil run on ethanol, an especially environmentally friendly and climate-neutral fuel that is made from local sugar cane. And many of the country's extremely successful and innovative industrial firms have also turned to

sustainable production. In Brazil's paper and pulp industry in particular, sustainable and environmentally friendly company management has now become a matter of course. At Klabin S.A., a customer of Voith Paper and the largest manufacturer of paper products in the country, this concept has now become the guiding principle for the entire group of enterprises, which is still largely family owned.

Up and away on the gondola

The red cars of the cableway, which sway with hundreds of employees from the village Telêmaco Borba to the paper mill on Monte Alegre in the Brazilian state of Parana at each change of shift, hang high above the Rio Tibagi. From their large windows, the visitor has a unique view of the mill, which was founded in 1946. The factory premises are a huge construction site at the moment as the capacity of what was already the largest paper mill in Brazil is currently being expanded by 1.1 million tons per year. Seemingly endless plantations of eucalyptus and pine trees extend behind the mill. On closer inspection, however, the attentive observer will notice that the monocultures are interspersed with large stands of native trees. The monkey puzzle trees, above all, with their unique upward-reaching branches are a particular eyecatcher.

Shortly after the gondola ride, Ivone Namikawa shows the visitor these typical southern Latin American trees up close, with their cones that are shaped like Brazil nuts. We find ourselves in the Monte Alegre natural park, which Klabin established in close proximity to its mill in 1992. There, the head of research and development in the company's forestry division explains the philosophy behind their plantation management. The woodland area belonging to the paper mill covers almost 90,000 hectares in total. This is equivalent to 900 km^2 and is therefore approximately the same size as the greater Berlin area. However, fewer than 50,000 hectares are planted with trees for paper manufacturing. The remainder, almost half the forest area, consists of either natural rainforest or is reforested by Klabin rangers. This terrain has been declared a nature reserve and may not be converted into plantations, even if the mill's capacity is expanded further in future. A similar situation can be found in the woodlands of another Voith Paper customer, pulp manufacturer Veracel Celulose S.A. Only about half of the 175,000 hectares belonging to the company in the south of the Brazilian state Bahia are planted with eucalyptus plantations. As with Klabin, the rest is a protected nature reserve.

With the cable car to work: the employees have an incomparable view of the mill

The dryer of the new board machine in Monte Alegre

Packaging for detergent is part of the extensive range of products manufactured by Klabin

Dozens of medicinal plants are dried for phytotherapy

Company-grown medicinal plants

While Veracel endeavors to re-establish rainforest that has degenerated into pasture land and to create corridors for the regeneration of natural fauna in its region, Klabin takes this several steps further. Ivone Namikawa proudly leads the visitor through a small storeroom in which an enticing aroma of spices and medicinal herbs emanates. Sacks of dried plants with exotic-sounding names and fragrances that tickle the European visitor's nose are piled on top of one another in stacks up to a meter high. Yet the qualified botanist can reel off the health properties of each of the almost 60 different plant species from the natural rainforest.

After all, Klabin has been studying which plants are found in the Atlantic rainforest, a relative of the primeval forest of the Amazon, and how they can be used sustainably for almost 25 years. "Operation Phytotherapy," an initiative whereby native medicinal plants are cultivated and processed into medicines and remedies, came about from the results of this research. Monte Alegre is probably the only paper mill in the world that also has a pharmacy selling these products. From stomach tea to aperients through to beauty creams, healing products exclusively from the native primeval forest – which are harvested and processed by Klabin staff – are offered.

This pharmacy may be a curiosity, but therapy with medicinal plants is certainly not. As a member of the Brazilian "Fund for Biodiversity," Klabin has pledged to protect the primeval forest and to practice sustainable forestry management. Economic use of the medicinal plants that are found in the rainforest helps conserve the forest because clear felling would destroy precisely the ecosystem these plants need to thrive. The remedies manufactured from these plants are not only sold in the pharmacy to the local community and visitors, but

Medicinal plants and seedlings for the plantations: Klabin's nurseries are versatile

Untouched nature: almost half of Klabin's properties are left in their natural state

Klabin's doctors also use them in the company's health service, where they have now replaced some of the conventional medicines. This not only provides work for the herbalists employed by Klabin, but also lowers the costs for the company's health insurance plan.

However, this unique juxtaposition of plantation management and the delicate use of the natural rainforest and its native medicinal plants is in no way the only aspect of sustainable management at Klabin. Rather, the company, which has an annual sales of around €1.24 billion and 17 paper mills, subscribes fully to sustainability and assigns an especially broad definition to the term. Sustainability at Klabin rests on three pillars. Apart from environmental protection, the group of enterprises also acts in a socially just manner, with a focus on economic growth.

The company's ecological orientation is not only evident in the fact that it has converted large tracts of land into nature reserves. In 1998, Klabin was the first company in the paper sector in South America to have its entire forest stand certified by the Forest Stewardship Council as being managed in an environmentally just manner, which proves the corporate office in Sao Paulo takes sustainability very seriously.

Vertical screen
Size 20, built in 1967
– *New MultiFoil rotor*
– *C-bar screen basket*
– *New screen basket seats*
– *Overhauled bearings*
– *New rubber seals*

The Voith Paper Fiber Systems Exchange & Repair Program

Anti-aging treatment for stock preparation machinery

When you need cost-effective, quality solutions for upgrading or rebuilding your machinery, look no further than Voith.

Our repair centers in Appleton, Wisconsin/USA, Ravensburg/Germany, Vaassen/Netherlands and Jakarta/Indonesia are staffed with competent, highly experienced professionals committed to partnering with you to get the most out of your hard-working stock preparation machines.

Ever-tightening budget restrictions, physical space limitations for process equipment, greater needs for machinery uptime, and intense competition all propel demand for aftermarket services to rejuvenate your aging, wearing equipment.

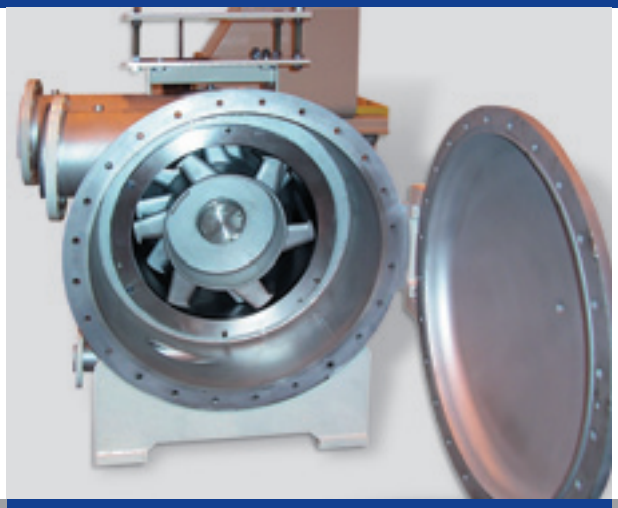
Voith repair centers also specialize in rebuilding customer components, assemblies and complete machines. We can provide these items according to original equipment manufacturer (OEM) specifications. Often, we can also provide a seamless upgrade to improved technology.

The Voith aftermarket offering includes completely remanufactured (reconditioned) machines from the current Voith product line, as well as Voith legacy products and competitors' machines.

The benefits of remanufactured machines from Voith are as follows:

- Guaranteed mechanical reliability and high product quality.

– *Old 6-foil rotor*
– *Deflected screen basket seats*
– *Old-generation screen basket*
– *Damaged rubber seals*



Beloit M24 screen
For approach-flow applications
– *Housing refurbished*
– *Bearings completely overhauled*
– *New energy-saving MultiFoil rotor and high-efficiency Voith C-bar screen basket*

– *Heavily worn housing*
– *All bearings in bad condition*
– *Outdated and inefficient rotor design*
– *Heavily damaged screen baskets*

- In many cases fiber and energy savings as well as greater production output.

What is remanufacturing?

Remanufacturing means reconditioning a worn component or machine rather than scrapping it and replacing it with a new one. Depending on customer need and preference, Voith offers the following possibilities:

- A remanufactured machine from inventory to replace the existing machine, which can be credited in part to the cost.
- Reconditioning of customer's existing machine at a Voith repair center, where it first undergoes a functional check to establish the cost-effectiveness of remanufacturing and/or upgrading. Voith reports findings to the customer before starting work, and can provide a replacement machine in the meantime.

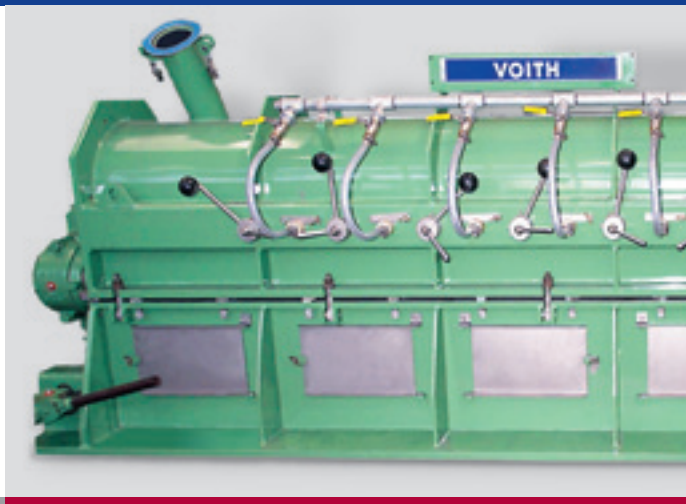
In either case, Voith's objective is the same: to provide customers with a machine whose quality rivals. And it goes without saying that remanufactured machines from Voith carry a 12-month mechanical warranty.

In addition to legendary Voith quality, backed by a solid warranty, Voith aftermarket customers also save money. Because of the high raw material cost associated with building a new machine, a remanufactured machine can often be offered at 60 to 70 percent of the cost of a new one. Most Voith products are fabricated from stainless steel, a commodity subject to volatile pricing and unpredictable lead times. In remanufactured machines, raw materials such as stainless steel are typically reutilized. The costs involved are mainly for the labor required to restore an item, and such costs are not only lower in general, but also more predictable.

How does the Exchange & Repair Program work for complete machines?

The Voith aftermarket business also meets the needs of mills that may lack the space or budget — or cannot afford the downtime — to purchase and install new machinery. For mills in such circumstances, the Voith advantage is clear: the complete "no worry" package of the Voith aftermarket pro-

Fiberizer model F2 dumping machine
- *Housing refurbished*
- *Rotor and bearings refurbished*
- *Screen plate replaced according to customer's specification*



- *Heavily worn inner and outer housing surfaces*
- *Damaged rotor foils and screen plate*

Rejectsorter model RS2B
- *Rotor and bearings refurbished*
- *Worn parts replaced*
- *Screen plate replaced according to customer's specification*

gram includes an exchange system that can lend mills a top-notch replacement machine while their existing one is being remanufactured in our repair center. Expensive alterations to process piping and existing foundations are not necessary, because the replacement machine fits exactly. As a further service, Voith also offers complete assembly and start-up supervision by our veteran team of technical professionals.

'Real World' example of the Exchange and Repair Program for complete machines

An existing vertical screen, supplied to a mill in 1977, experienced the kind of wear and tear one might expect after three decades. Screen basket seats were deflected outside of their prescribed tolerances. The rotor hub had been damaged during periodic reworking by the mill's maintenance team and was also out of tolerance. The foil edges were damaged and far outside their design clearance from the basket face. The screen basket was also damaged. All this led to spinning trash, pulsations, excessive fractionation and thickening, and the associated fiber and energy losses.

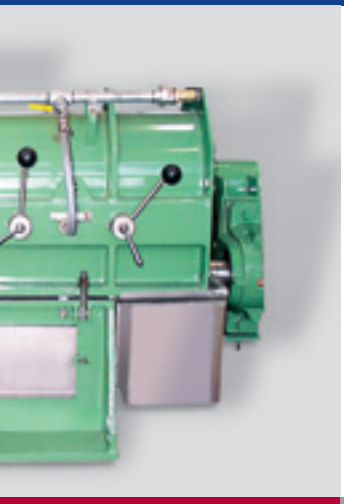
Since mill production demands left no room for the machine to be out of service for any appreciable time, Voith offered an exchange machine while the vertical screen was being remanufactured. Thanks to careful checking and planning, it fit the existing piping and foundation layouts precisely.

Since it ran exactly the same way as the machine being remanufactured, the machine operators did not need any additional instruction or training.

The customer's stock of spare parts could still be used, with full interchangeability among the mill's several machines of this type.

How does the Exchange & Repair Program work for machine components?

The remanufacturing approach we offer for complete machines can also apply to individual components. The complete Voith "no worry" package is customized through the exchange program to specific customer needs. The exchange program is a type of service contract through which Voith



Centrifilter STC 400
Filtrate screen for black liquor
- *Housing refurbished*
- *Rotor and bearings refurbished*
- *Screen basket replaced*
- *Protection cover replaced*
- *New double-acting ring seals with new sealing water monitoring*
- *New corrosion-resistant O-rings and seals*

- *Rotor and housing heavily damaged*

- *Heavily worn housing*
- *All bearings in bad condition*
- *Damaged protection cover*
- *Damaged rotor*
- *Heavily damaged screen basket*

provides punctual, pre-scheduled deliveries of a machine's wearing parts. After determining the appropriate exchange cycles, Voith and the customer contract for new or remanufactured components on a predictable basis — an important tool for mills that want to control maintenance and repair costs, minimize operational worries and maximize uptime while also reducing their own labor outlay.

Conclusions for the future

Over the last few years Voith repair centers have successfully remanufactured numerous complete machines and individual components. Voith offers both the technical expertise and industry-leading technological advancements that set us apart from competitors. The scheduled expansion of our global repair center network for even closer customer support will make anti-aging an increasingly attractive solution for reutilizing existing machinery and components. We offer remanufactured machines that are not only mechanically dependable, but also meet the most rigorous process technology and quality requirements. Remanufactured machines from Voith also add value for customers by always incorporating the latest design advancements available for each particular product.

The results are improved mechanical reliability, often with fiber and energy savings, outstanding product quality, and enhanced production capacity from case to case.

In other words: anti-aging pays off!

Contact

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Stock preparation line modernization in a former USSR collective combine: JSC Kiev Cardboard & Paper Mill

A complete rebuild without any downtime

Voith Paper's modernization of the multiple stock preparation lines on KM 1 board machine at JSC Kiev Cardboard & Paper Mill in the Ukraine was a masterpiece indeed.

This rebuild not only improved paper quality significantly, but also minimized fiber losses while substantially reducing energy and freshwater consumption at the same time. And particularly pleasant for the customer was that during the entire rebuild, not a single day of production time was lost at the board machine.

Back in the eighties, Escher Wyss played a key role in building two of the former USSR's biggest collective papermaking combines: in Kiev and in Leningrad, now called St. Petersburg. The scope of supply comprised four board machines, each with several stock preparation lines using recovered paper furnish, still quite unusual in those days. Nobody could have guessed then that a quarter of a century later under the project name Obukhov SP KM 1, Voith Paper Fiber Systems would carry out here the biggest stock preparation line rebuild so far in the former Eastern Bloc.

With four board and tissue machines plus extensive further processing lines, JSC Kiev Cardboard & Paper Mill in Obukhov, about 40 kilometers south of Kiev, is still Ukraine's largest paper mill. In October 2004 Voith Paper's long-standing relations with this customer led to the signing of a rebuild contract worth tens of millions. During the course of political turmoil affecting the entire Ukraine, it was questionable whether this project would ever be realized, but when the situation became more stable in early 2005, the contract finally took effect.

Continuing the plant diagnosis work that started at the tendering stage, a detailed assessment was then carried out. The first challenge was how to minimize downtime which is always a problem during rebuild projects. But instead of the several weeks of downtime initially forecast, Voith Paper set a milestone here: the stock preparation system for the KM 1 board machine was completely rebuilt without any downtime at all!

This was made possible by a phased rebuild concept enabling at least two of the four stock preparation lines, whether already rebuilt or not, to stay in operation. The partial dismantling, the incorporation of new machines and equipment and the commissioning of the newly modernised lines had

Charging zone before and after the rebuild

View of the deinking lines with old refiners prior to rebuild

Cave Monastery Pecherska Lavra, Kiev, Ukraine

to be realized while other lines continued their operation.

All deliveries of process machinery for recovered paper, conveying systems, fiber, rejects and water treatment, pumps, podiums, walkways, comprehensive automation and process control systems, field instrumentation, erection materials, switchgear and motors, as well as the chemical preparation system had to be coordinated to suit this rebuild concept. Also the process engineering and automation, erection supervision and commissioning services were coordinated with the same flexibility.

The four stock preparation lines serve for folding boxboard production. All but the top layer use secondary furnish. To ensure optimal utilization of the furnish used for the under top layer, the Voith Fiber Systems Technology Center in Ravensburg carried out flotation trials with recovered paper collected in the Ukraine and Russia. The performance capabilities of these modernized lines was proven by guarantee trials in which compliance with nearly 20 warranty parameters had to be verified.

This rebuild resulted not only in a substantial reduction of energy and freshwater consumption, fiber losses and rejects volume, but also in significantly improved product quality. All results of this modernization already exceed expectations at the time of writing.

Customer Comment

Sergey N. Koval
Deputy President
JSC Kiev Cardboard & Paper Mill

"A Russian proverb says: the first pancake is never a good one. But not in this case, this one was perfect! For us it was fantastic that Voith modernized our plant so successfully while at the same time upholding full production and customer satisfaction. This project is unparalleled: I have never heard of such a successful one – it belongs in the Guinness Book of Records!"

The same view after rebuild, with new refiners and additionally installed water treatment

Contact

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A custom-made modernization concept

Better quality and increase in production through ModulePro

Due to the exchange of the roll moisturizer with the ModulePro nozzle moisturizer, a speed increase of 100 m/min was achieved on the CM 1 and CM 2 at Koehler Kehl GmbH, Germany. The paper quality was also significantly improved.

The paper mill August Koehler AG can already look back on a 200-year company history, which testifies to success and innovation. At the branch mill that went into operation in 1988 in Kehl, Germany, today known as Koehler Kehl GmbH, thermo papers, carbonless copy papers and resin impregnated papers are produced on three ultramodern Voith paper machines.

The products

Thermo papers are meanwhile found in all areas of everyday life: as sales slips or price labels in the supermarket, as tickets and many other uses. Thermo papers are produced in Kehl at Koehler on paper machines PM 1 and PM 2 supplied by Voith and are upgraded on the coating machines CM 1 and CM 2.

These thermo papers are given a functional coat that reacts. With the addition of heat, a physical melting process takes place in this function coat, through which the black lettering develops.

The paper mill Koehler Kehl GmbH ranks among the market leaders and most experienced producers in the field of carbonless copy papers. Duplicating papers are produced on PM 1 and provided with a further coat on CM 1. On PM 6 exclusively resin impregnated papers have been produced since September 2000.

The challenge

Duplicating papers and thermo papers are upgraded on CM 1, and thermo papers are upgraded on CM 2. For it, this paper is double-coated on one side.

The precoat is applied with a Speed-Sizer in PM 1 or PM 2. The finish coat is applied with a Curtain Coater. The paper has a curl tendency toward coat side.

For curl reduction, until now a roll moisturizer has been used, which tends to vibrate at high speeds. Due to this, the coating machine is limited in its speed. In addition, maintenance of the rolls of the moisturizer is very costly and time-consuming. Zonal CD moisture profiling for improvement of the paper quality was not possible.

The goals

High targets were set for the project, which were successfully implemented with the Voith ModulePro nozzle moisturizer. These were, specifically:

Paper mill Koehler Kehl GmbH, Germany

ModulePro C nozzle moisturizer

Water station for supply of ModulePro C

Customer comment

Georg Streif
Production manager
PM 2 und SM 2
Koehler Kehl GmbH,
Germany

"On the basis of joint projects on the existing coating machines at Koehler, a custom-made modernization concept with regard to curl handling was developed and implemented with the ModulePro.

The start-up and optimization, carried out in a spirit of partnership, ensured a picture-perfect start-up. Voith's scope of supply as well as the two companies' know-how in the field of thermo coating papers have turned our coating machines into the most productive machines in this field worldwide. The project goals have been fully achieved. Top performance."

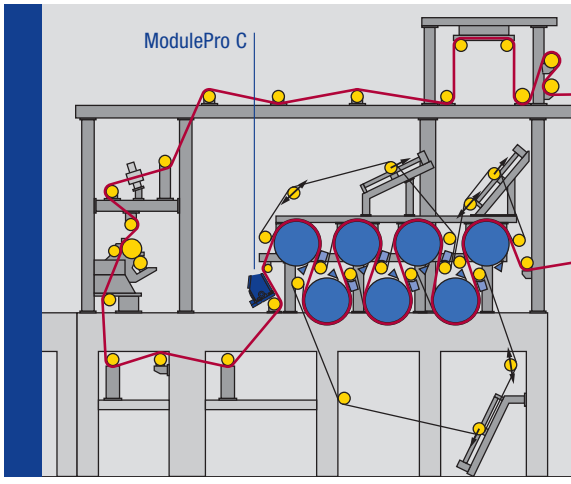
- Curl reduction on CM 1 and CM 2 with the use of a "ModulePro C" nozzle moisturizer even at speeds of over 1,100 m/min (CM 1) and 1,600 m/min (CM 2).
- Increase in overall production for CM 2 through a speed increase by more than 100 m/min, which means matching production to that of PM 2.
- Improvement in CD moisture profiling by the Profilmatic MP CD profile control with a zone width of 50 mm.
- Reduction of the service time on CM 1 and CM 2 (no roll change and reduced maintenance work).

Implementation

In May 2006, Koehler Kehl GmbH and Voith agreed on the implementation of the project and thus delivery and installation of the ModulePro C for CM 1 and CM 2. Set as delivery date for CM 2 was December 2006 and for ModulePro C for CM 1 January 2007 followed by installation and start-up.

For the implementation of the project requirement, a special design, Voith, therefore, had just 6 to 7 months left. The projects were implemented in close cooperation with Koehler Kehl.

ModulePro C at coating system CM 2



Offline coating machine CM 2

The ModulePro C was integrated into the processes of CM 1 and CM 2, as requested.

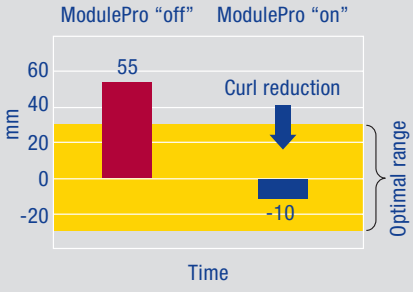
The results

Through the successful use of the ModulePro C the operating speed was increased by 100 m/min on CM 1 and CM 2. This substantially boosted the output of the two machines.

But it is not only the increase in operating speed but also the enhanced quality of the paper that is attributable to the ModulePro nozzle moisturizer. In this way it was possible to reduce the curl tendency in the paper on CM 1 and CM 2. At the same time, the CD moisture profile was improved by 20 to 30 percent on both coaters. Due to the contactless process, a negative impact on the coat application is avoided.

Coating machine CM 2
Paper grade thermo papers 50 - 78 g/m²
Machine speed up to now
max. 1,600 m/min
Paper width 4,200 mm
Paper production PM 2

Coating machine CM 1
Thermo papers and duplicating papers
"REACTO" 56 - 90 g/m²
Machine speed max. 1,100 m/min
Paper width 4,200 mm
Paper production PM 1



Example: Ideal effect on paper curl by ModulePro moisturizer on graphic papers

Contact

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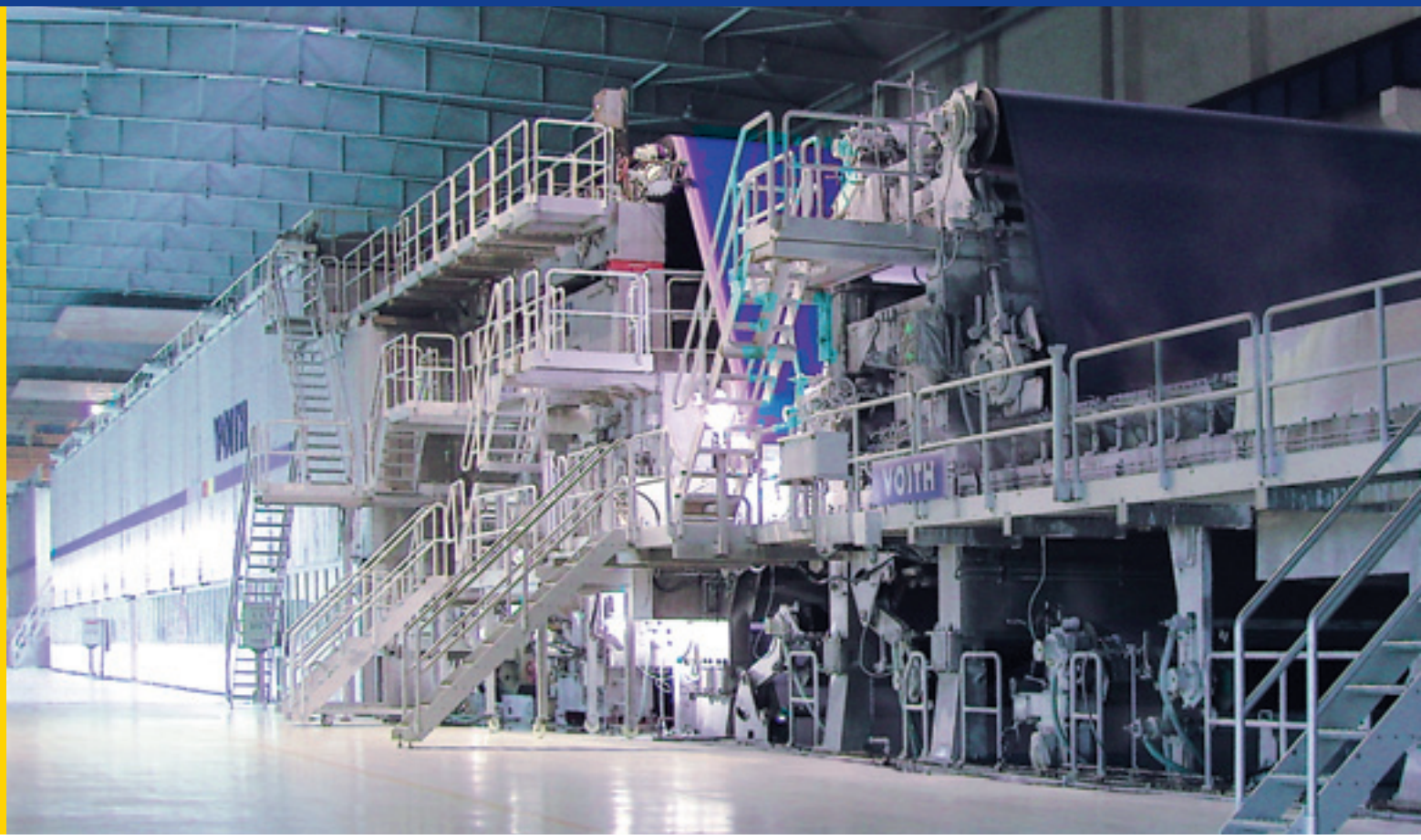
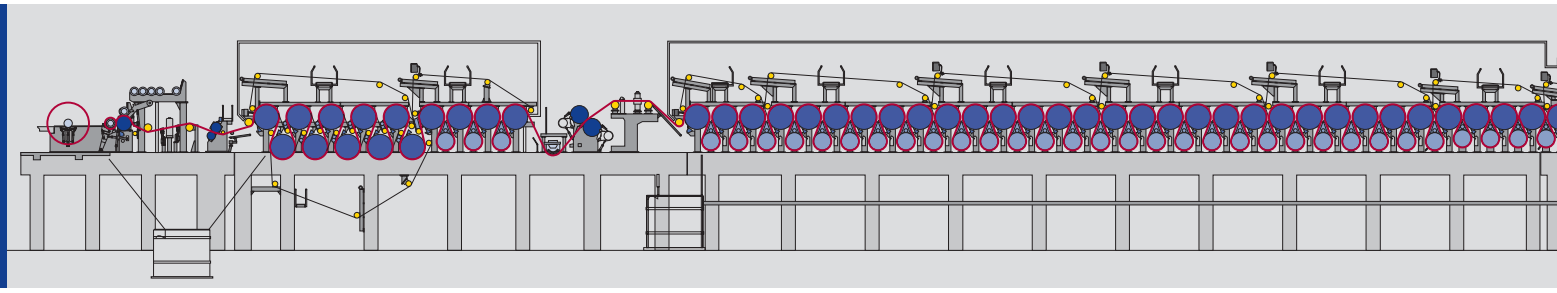


Start-up of the new PM 21 at Sun Paper in record time

In just 6 hours to salable paper

The Chinese paper producer Sun Paper in Yanzhou, Province Shandong, achieved a record immediately after start-up of the new PM 21 from Voith. In just six hours after "Stock on Wire", the team were able to produce salable paper at the reel.



SpeedSizer

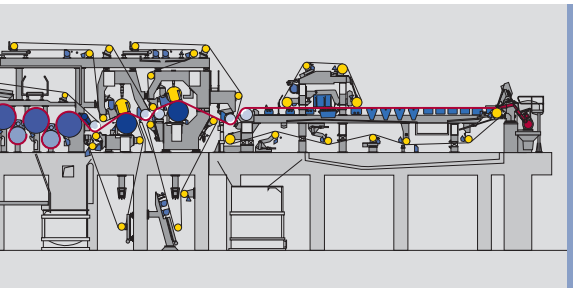
Since start-up, 700 metric tons of woodfree-coated base papers, but also offset or copy papers are produced on PM 21 every day.

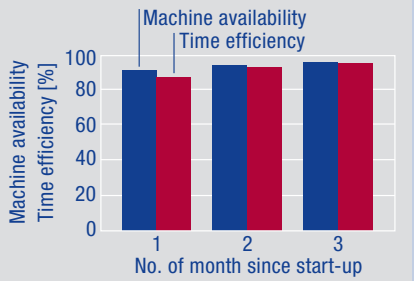
Praise has come from all sides about the good cooperation with this project, both from the Production Manager at Sun Paper, Hu Qiao Zhong and from Dr. Martin Zimmermann, Voith Paper's Chief Start-up Engineer. "We were a strong team. We worked out a detailed plan and pursued only one goal: to start up PM 21 as early as possible to give Sun Paper a new impetus to grow," reports Dr. Zimmermann.

"We have also fully achieved this. The 6-hour record has even topped a great performance," Voith's Project Manager Joachim Gütler went into raptures about it. It was not until the end of September 2006 that the installation of PM 21 in Yanzhou started. Only six months had passed until the start-up at the beginning of April 2007. Since then, PM 21 has been producing paper in continuous operation without any major downtime.

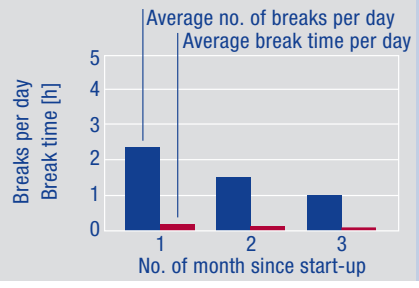
It was not only the start-up of the machine itself, but also the development of machine availability, the runnability and the production rate that are impressive. In the first two months after start-up the machine speed was already brought up to 1,250 m/min, at a basis weight of 80 g/m^2. With heavier paper grades a daily output of 900 metric tons was also achieved. "Particularly pleasing for the user is that, on average, the machine has approximately only one sheet break a day. In the first weeks after start-up we even had several production days without sheet breaks. Therefore, outstanding machine availability and excellent runnability were achieved," according to Joachim Gütler. Verification of the warranties was carried out with success as early as in July, just 3 months after start-up. The quality of the paper produced was at a very high level. After such a short time the paper machine could be operated constantly at high production with very good quality – a magnificent result.

The first-class start-up of the machine is certainly also based on the fact that machine and machine clothing come from a single source. Voith Paper Fabrics was integrated into the project at an early stage and





Development of machine availability and runnability in the first quarter after start-up



Average number of sheet breaks and break time in the first quarter after start-up

supplied the complete machine clothing for trouble-free start-up: 3-ply PrintForm SSB fabrics, PrintFlex press felts and PrintTech dryer fabrics.

PM 21 is the first order for Voith Paper from the growing Chinese paper producer, Sun Paper. The paper machine has a wire width of 5,400 mm and a design speed of 1,300 m/min. Sun Paper was convinced of the One Platform Concept from Voith Paper right from the start and, therefore, decided to award this order to Voith.

The scope of supply includes a MasterJet F headbox with the proven ModuleJet dilution water system for the generation of excellent CD basis weight profiles with variation coefficients below 0.4 %. A DuoFormer D ensures not only high drainage capacities but also excellent formation with Ambertec values of less than 0.4 $\sqrt{g/m^2}$. For such fast and efficient machines, the Tandem NipcoFlex press section with transfer belt is the ideal press concept. A closed web run through the entire press section in conjunction with high drynesses is the basis for good runnability. The two NipcoFlex presses, however, also ensure a very equal-sided base paper. In conjunction with the soft-nip calender, a roughness two-sidedness of less than 10 % is achieved on the finished paper.

The TopDuoRun pre-dryer section is the appropriate concept for maximum production speeds. It consists completely of single-tier dryer groups with top dryers. The SpeedSizer AT applicator ensures a uniform application of the film during surface sizing. The after-dryer section with Airturn as well as the single and two-tier dryer group is responsible for a reliable web run and efficient drying before calendering. An EcoSoft calender with Nipcorect roll is used for the latter. The 34 zones across the machine width ensure a uniform CD caliper profile thanks to the Profilmatic Control System. Finally, the MasterReel also ensures faultless winding for surface-sensitive papers with parent roll diameters in excess of 3 meters.

Project Manager Joachim Gütler is confident that the trouble-free start-up of PM 21 achieved in record time at Sun Paper is advantageous for possible follow-up projects. “Sun Paper is an important customer for us, who produces very high-quality papers and whose growth potentials have not yet been fully utilized.” But also other customers, principally in India and China, are convinced of this concept. In the meantime, other, similar machines have been sold.

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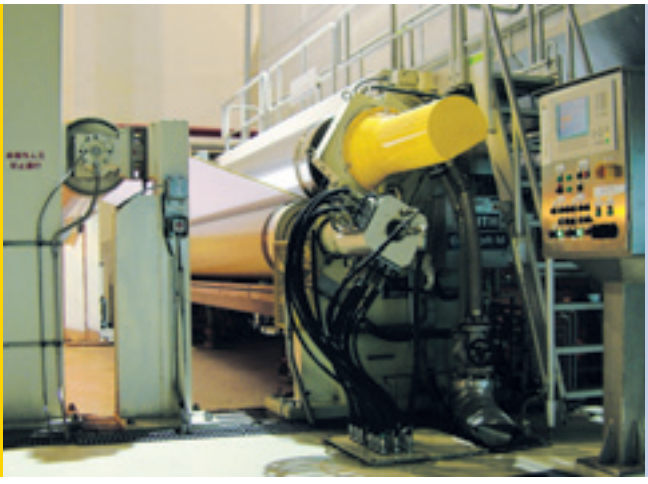
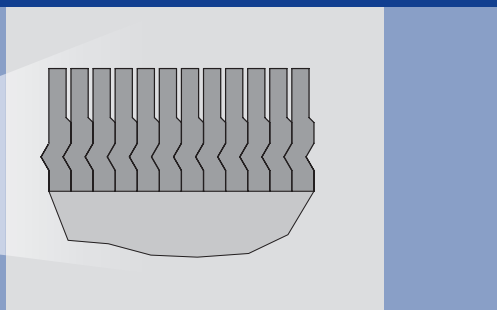
EcoSoft Calender



MasterReel



Maximum performance due to stability and wear resistance

New grooved stainless steel roll cover – G-Flex

To supplement its already very comprehensive portfolio of possible roll covers, Voith Paper has developed a grooved stainless steel roll cover – G-Flex. G-Flex provides for stable drainage and together with the extremely high wear resistance this results in long running time intervals and high economic efficiency.

Voith Paper sees itself as a process and system provider for the paper industry. In order to optimize the performance of the press section, along with high-performance functional rolls, such as in the NipcoFlex shoe press, there are also fabrics specially coordinated to the grade and the drainage rate. Another essential component of optimization is also, of course, the selection of suitable roll covers.

The G-Flex cover is manufactured by winding a molded stainless steel wire onto a roll shell under great tension and contact forces. The wound square wire is produced with high precision by means of cold rolls and, due to its material composition, has excellent corrosion resistance. Through this one obtains a grooved roll cover with very high dimensional stability and the highest wear resistance. This press roll cover meets the requirements of the most demanding press positions with the highest dynamic loads.

The new G-Flex roll cover can be used on crown-controlled rolls, press rolls with multi-nip zone control, such as NipcoF, solid press rolls or backing rolls of shoe presses, such as the NipcoP roll. The use of G-Flex is not limited to just Voith Paper press rolls, but can also be used on press rolls of other manufacturers.

Due to the high wear resistance of G-Flex, long grinding intervals for optimizing the efficiency of a paper machine can be assured. At the same time, there is maximum resistance regarding doctoring and high pressure spray pipes and resistance against all chemicals used in the paper production process. Optionally, the wear resistance can be increased even further by applying a CeraVent hard metal cover.

The main advantage of the G-Flex cover is the retention of its storage volume and its open area even with the highest linear loads, thus guaranteeing stable drainage. In addition, there is the high wear resistance of the G-Flex cover. These two advantages guarantee long running-time intervals and high economic efficiency.

Within a short time, Voith Paper has received a considerable number of orders for various reference machines with DuoCentri, Single or Tandem NipcoFlex press sections. This shows the flexibility of this roll cover, which can be used for practically all press concepts.

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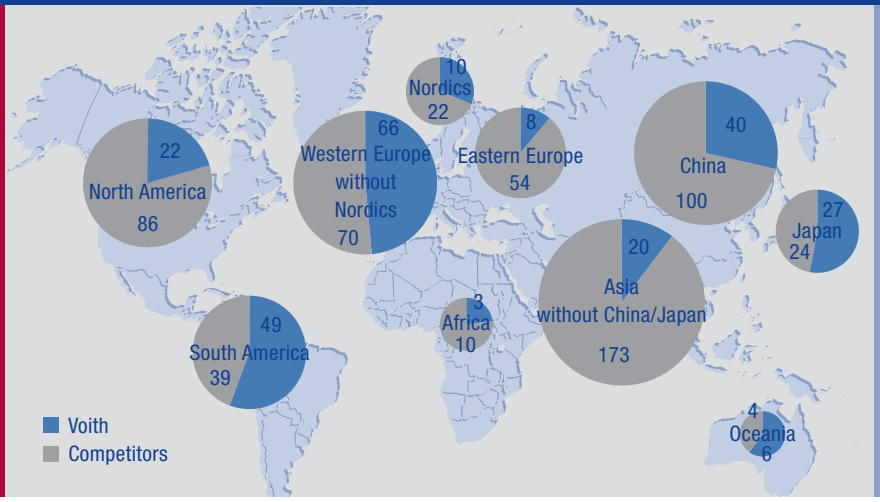
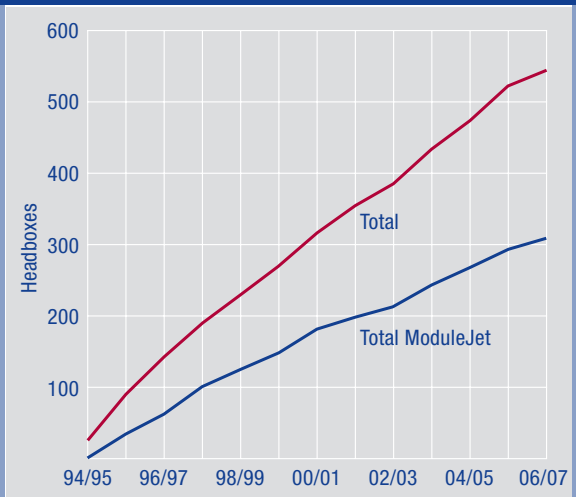


Voith headbox market share since 2001



Voith headbox installations with and without ModuleJet

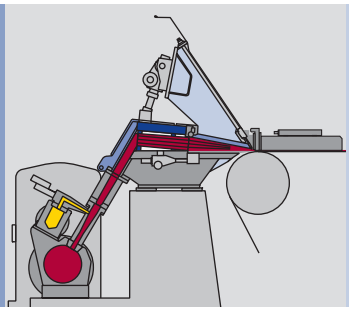
Improved paper quality through the adapted headbox

MasterJet II – for super sheet formation

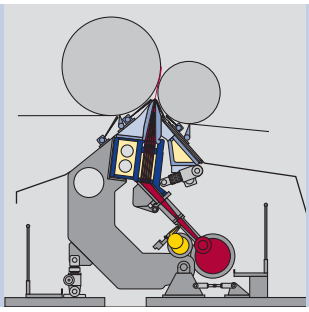
Among all the factors influencing paper quality, the headbox plays a key role. State of the art in this connection is the MasterJet II headbox family, which incorporates not only decades of papermaking experience and technological know-how, but also the latest findings both in research and practice.

In 1994 Voith revolutionized headbox technology by introducing the ModuleJet dilution system. This innovative technology markedly improved paper quality in terms of basis weight profile and fiber orientation, also resulting in smoother operation, greater production output and fewer web breaks. Thanks to this and its reliability, the ModuleJet concept was soon adopted throughout the paper industry. Over the last 13 years it has been applied to more than 300 headboxes, including over 40 headbox rebuilds. During the same time period Voith has sold more than 500 headboxes in total, thereby upholding its positioning as market leader in this field:

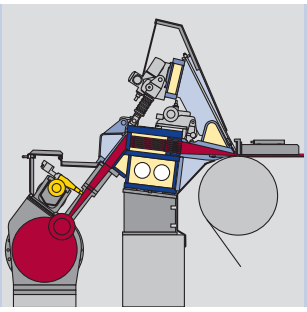
MasterJet II F/B



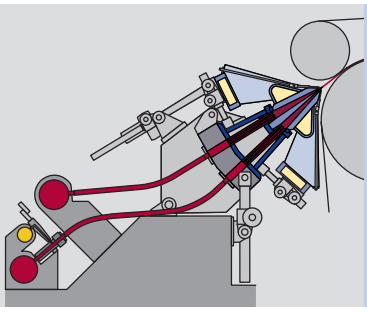
MasterJet II G



MasterJet II F



MasterJet II M2



our market research findings show a global market share of 26% for Voith headboxes. This remarkably high market share, considering the large number of competitors, is due not least to the fact that Voith can supply exactly the right headbox for practically every application.

Currently the Voith headbox family mainly comprises the MasterJet II F/B, F, G and M2 versions. These cover fourdrinier, hybrid and Gap-Former applications at speeds of 70 to 2,200 m/min over a wide range of basis weights and stock compositions. The specific stock flow rates range accordingly from 1,500 to 38,000 l/min/m, thus making it very difficult to cover the entire application range with a single headbox concept. The MasterJet product line is however the perfect solution for practically all applications, except in a few cases where a special design is required, such as the RollJet rectifier roll headbox for cigarette paper or greaseproof papers.

The MasterJet II headbox is distinguished by its flexibility, dependability and extremely high quality results, due also to additional features including:

- Pulsation damping:
  A buffer tank with damping plate and air cushion efficiently smooths out any pulsations emanating from the approach flow section.
- Cross distribution:
  A cross flow header with optimized parabolic geometry ensures constant static pressure over the entire machine width.
- Consistency control:
  ModuleJet modules regulate the stock consistency for efficient basis weight profile correction.
- Turbulence generation:
  The MasterJet II tube bank generates optimal turbulence thanks to its square outflow cross-section, optimized flow steps and interchangeable inflow inserts.
- Jet formation and trajectory:
  The optimized nozzle, lamellas, slice blade and bottom lip ensure perfect jet quality.
- Maintenance friendliness:
  The stilling chamber and the nozzle can be opened over the entire machine width to enable optimal maintenance access.

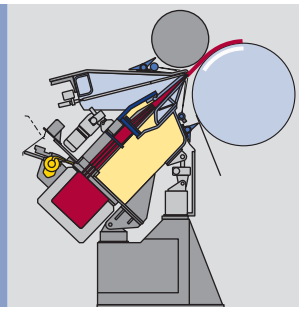
Apart from new headboxes, rebuilds of existing headboxes are increasingly in demand. It has been possible ever since 1995 to upgrade Voith headboxes with ModuleJet dilution technology. Since 2004 a special version is available for other makes of headbox: the ModuleJet DR (Dilution Retrofit). In this version the dilution medium is fed through a dosing plate between the back of the headbox and the existing header.

This ModuleJet version was installed very successfully on SymFlo headboxes in Ettringen and Rauma. Further installations will follow shortly on Tampella and Beloit headboxes.

Installing an EdgeMaster is a small but often decisive step toward improving sheet edge quality. By ensuring clean suspension on the wire edges, this sealing strip with adjustable geometry effectively prevents edge wave formation.

In summary, the Voith MasterJet meets the highest demands with regard to hydraulic concept, adjustability, user friendliness and maintenance access. It also sets benchmarks in materials selection, manufacturing precision and surface quality.

ModuleJet DR



Improves sheet edge quality: EdgeMaster

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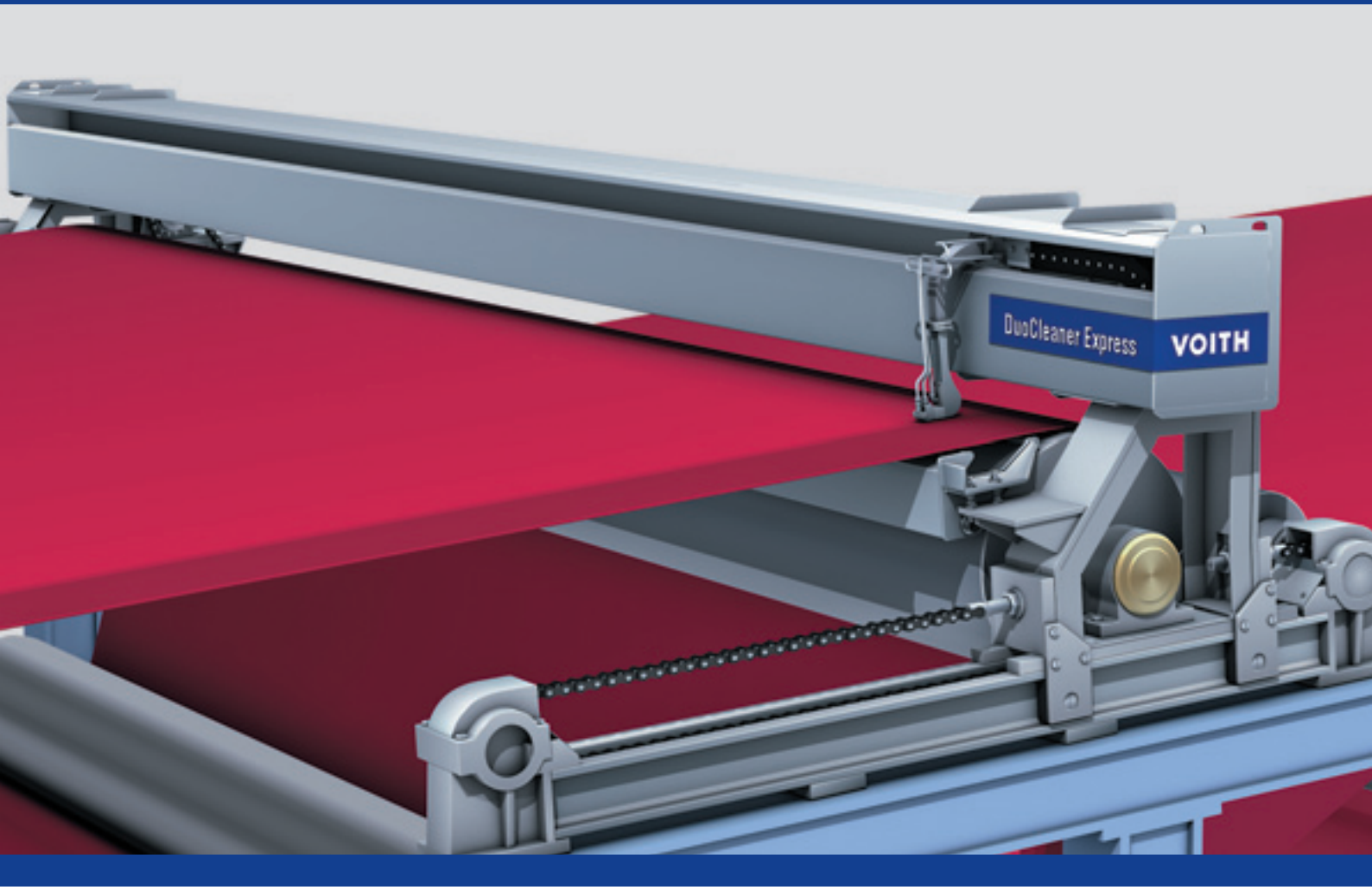


Guarantees troublefree operation and reduces the necessary maintenance

DuoCleaner Express – innovative dryer fabric cleaning

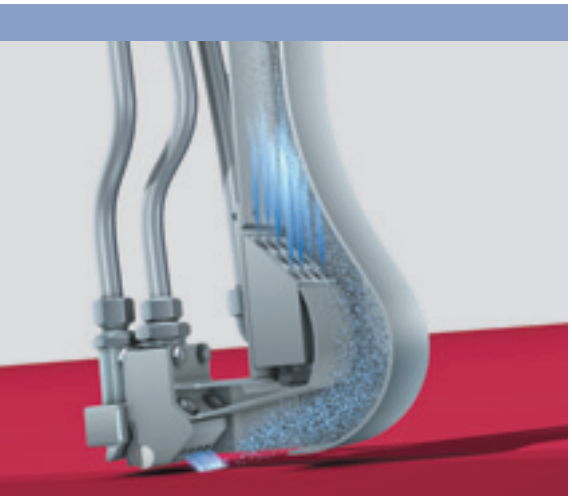
The DuoCleaner Express meets all demands for highly efficient cleaning of dryer fabrics. Due to a continuous cleaning of machine clothing a reliable production process can be guaranteed.

Today's high-tech paper machines can reach speeds of 2,000 m/min and sometimes even more. For sustainably optimal productivity under such conditions, close tolerances and fine-tuning for constant operating parameters are indispensable.

An important role is played here by paper machine fabrics, which have to keep up optimal performance for as long as possible during operation. A good way to ensure this is by continuous fabric cleaning, where Voith DuoCleaner technology is the established leader.

The Voith DuoCleaner with its rotary head continuously cleans the fabric during operation. The success of this technology is shown by the fact that more than 800 DuoCleaners are now installed worldwide. By adjusting the operating parameters accordingly, at working pressures of 200-350 bar various fabric cleaning tasks can be performed in the wet and dryer sections of paper, board and tissue machines.

Dryer fabric permeability is very important for paper quality and production efficiency. Dirt deposits on the fabric reduce the permeability, which in turn reduces heat transfer in this area. This naturally leads to poor drying performance, tail transfer problems, bad moisture profiles and high steam consumption. That is why dryer fabrics have to be changed so early – not because of wear and tear, but simply because they are no longer permeable enough.



DuoCleaner Express in operation

Particularly in the case of forming fabrics and press fabrics, the rotating water spray nozzles on the DuoCleaner head are extremely important because they enable correct adjustment of the local cleaning duration and intensity. In the dryer section, however, there is a risk of nozzle rotation being impeded or blocked by infiltrating dirt and by dry out of the hydrostatic ceramic bearings. Since access to the cleaning heads is not always possible during production, the DuoCleaner principle was further developed for use with dryer fabrics.

The result is less maintenance effort and better cleaning at the same time.

The latest Voith DuoCleaner – the DuoCleaner Express – is now the best solution for continuously cleaning conventional dryer fabrics. Instead of using cleaning heads, it has a newly designed cleaning boot. Cleaning takes place on the side in contact with the paper, which is where the dirt collects, in step-by-step mode.
In other words, the cleaning boot remains stationary at one point over the dryer fabric until the latter has revolved a certain number of times. Then the boot changes position moving by its working width lateral to the dryer fabric. After cleaning the entire fabric width in numerous steps, the DuoCleaner Express travels at high speed to the other side of the machine for dirt removal at a cleaning station. Then the cycle starts over again, either immediately, or after a predetermined pause.

The new cleaning boot on the DuoCleaner Express uses a cleaning block with several fixed nozzles spraying the fabric at an angle for efficient dirt removal. By impinging obliquely, the water is tossed together with dirt particles into the cleaning boot's drainage duct.

Vacuum is generated at the beginning of the drainage duct by a water jet injector in the cleaning boot. The resultant suction ensures efficient removal of the dirty water. A small part of the cleaning spray water penetrates the

fabric, and in case of heavy contamination it can be collected in a trough underneath. Following the cleaning boot is an air knife for removing residual water from the fabric. This eliminates the problem of water stripes and prevents loose dirt particles from being carried along. The suction drainage duct is usually connected via a separator to the paper machine vacuum system for dependable removal of dirt and water.

The highly effective DuoCleaner Express system with fixed cleaning nozzles ensures troublefree operation in the tough environment of the dryer section, and requires considerably less maintenance than conventional DuoCleaners with rotary cleaning head.

In summary, both on modern paper machines and older ones, efficient dryer fabric cleaning during production upholds optimal efficiency. This is reflected not only in better paper quality, but also in fewer web breaks and lower drying energy consumption.

Stable running at high operating speeds with a minimum of breaks is even better guaranteed with well-proven web stabilizers like Pro-Release, and with clean dryer fabrics with the correct permeability. Productivity is increased thereby, and paper quality will always be better.

The Voith DuoCleaner Express with its new operating principle meets all demands for highly efficient cleaning of dryer fabrics as well as simplified maintenance.

Also for retrofitting and upgrading existing cleaning systems, the DuoCleaner Express offers a very good return on investment. Upgrading a conventional DuoCleaner to DuoCleaner Express is usually no problem at all, because both systems have comparable operating parameters and largely compatible components.

Important DuoCleaner Express references include the installations at Palm Wörth and UPM Schwedt, where other type of products were replaced successfully, followed by supplemental orders.

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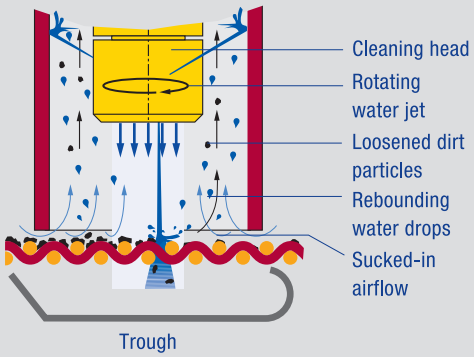
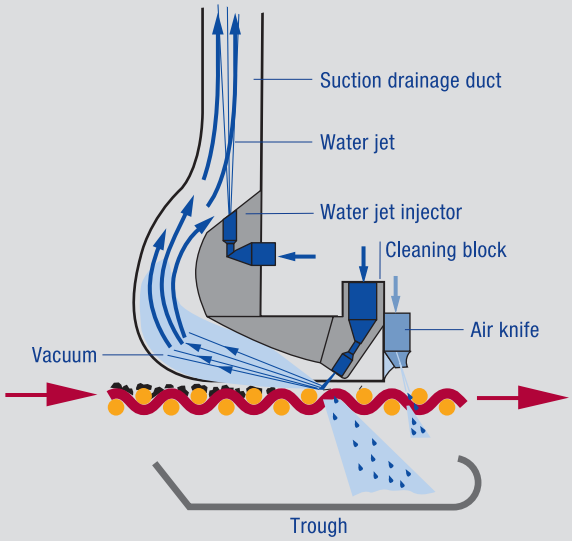
Comparison between DuoCleaner and DuoCleaner Express

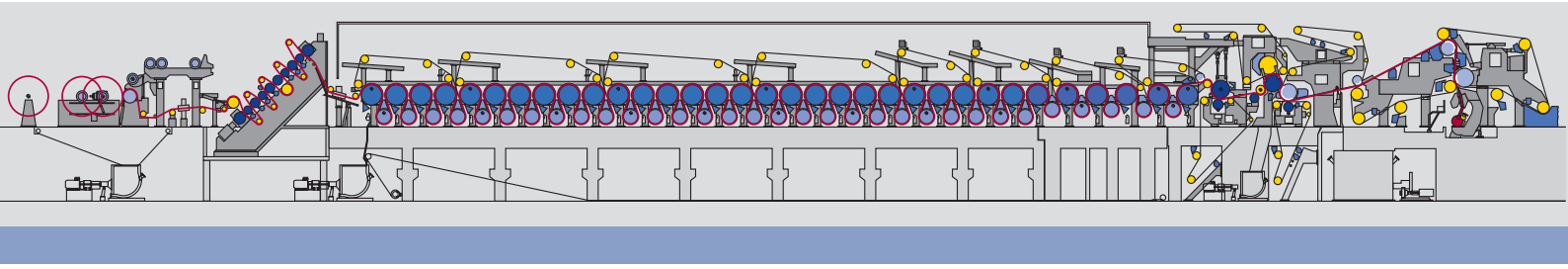




Stable grade changes on the PM 6 at Stora Enso Maxau

800 tons more paper thanks to OnQ GradeManager

How can you change from one paper grade to another without producing broke in the transition phase? Every papermaker concerns themselves with this question. The OnQ GradeManager by Voith Paper Automation offers a solution. It ensures a smooth grade change and therefore less production loss.



Based on Voith's in-depth process knowledge, OnQ GradeManager coordinates the quality controls on the PM 6 during a grade change and therefore brings about a huge reduction in broke.

All around the world, paper machine operators are looking for ways and means in which to increase the added value of their plants. However, the investments needed are usually only possible if guaranteed profitability is ensured. Voith Paper therefore set itself a goal of helping paper manufacturers improve their existing plants in three fundamental aspects with the aid of reliable automation products:

- to increase added value across the entire plant,
- in order to reduce the energy consumption required
- and to reduce the costs for the use of raw materials.

Stable, quick change

Using the latest multivariable control methods, the OnQ GradeManager which has already been implemented and tested on the PM 6 at Stora Enso Maxau, Germany, coordinates the entire manufacturing process during the critical phase of a grade change. Practical experience shows that by using the OnQ GradeManager, grade changes on the PM 6 are more stable and 800 tons more paper can be produced annually. This translates to an increase in turnover of around € 500,000 per year.

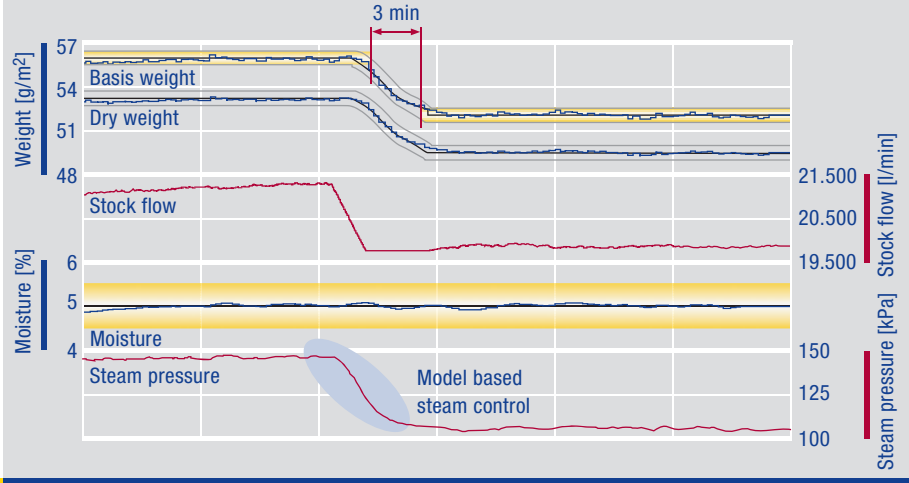
The fact that several minutes normally pass before production is back to within the quality specifications highlights the challenge that is faced in a stable grade change. The result is clear: the paper produced in this time does not have the same quality as that produced under stable production conditions and, therefore, either cannot be sold or cannot be sold for the same price. However, a modern paper machine produces more than 10,000 m^2 paper per minute, which means the resulting production loss is considerable.

The OnQ GradeManager therefore monitors the paper quality during a grade change by essentially controlling three components:

- firstly, the stockflow into the short circuit to maintain the basis weight,
- secondly, the steam pressure in the dryer section for constant moisture
- and finally, the addition of fillers for the ash content in the paper.

Based on the paper machine's operating point in production and the new grade to be produced, OnQ GradeManager calculates accurate target values for stockflow, steam pressure and the addition of fillers. It also presets when and how the three values are changed in the course of the grade change so the new grade can start as quickly as possible with the greatest process stability.

Niels Hardt, product manager at Voith Paper Automation, makes a compari-



Through model-based steam pressure adjustment, OnQ GradeManager makes quick grade change times possible in Maxau (here 3 minutes), while maintaining constant moisture. Production loss during a change is therefore reduced to a minimum.

Using data taken by the scanner, OnQ GradeManager monitors the grade change for the paper web's basis weight, moisture and ash content.

son with a navigation system. "There I also choose my destination. The program then leads me according to my preferences via either the quickest or the shortest route."

Stora Enso profits from less broke

Around 260,000 tons of SC/B paper are produced annually on the PM 6 in Maxau. On average, 20 grade changes are made per month, during which broke has been reduced drastically thanks to OnQ GradeManager.

"After optimizing the grade change, an average of 9,000 m less broke is produced per change," explains Michael Wehr, who is in Maxau responsible for the quality control system of the PM 6. On an annual basis, this means additional production to the value of € 500,000.

Due to the general trend in the paper industry towards smaller and smaller batches, Stora Enso Maxau will increase the number of grade changes in future too, which means the savings and therefore also the added value of the plant can increase even more.

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The quality of the new product has also convinced APP Ningbo's customers

The first DynaCoat C in China becomes operational

APP Ningbo BM 2 moves into art board production

Producing top market quality art board is no easy task, but by no means impossible when one has the right equipment. Voith Paper took less than ten days to convert the Ningbo BM 2 for the production of both ivory and art board and thus continue a Chinese success story.

APP Ningbo Zhonghua Paper Co. Ltd., which has its headquarters in Duantang, Ningbo, in the province of Zhejiang, mainly produces high-quality types of board on three machines. With production in excess of 500,000 t/y, APP Ningbo is one of China's largest board manufacturers.

One of the main reasons for the modifications to the BM 2 was the desire for an increase in production capacity. However, not just quantity, but quality was also a critical factor.

Moreover, APP Ningbo was looking to extend its product range from ivory board to include art board. This should display symmetry, as well as uniform smoothness and gloss on both sides. In order to attain these objectives, an additional DynaCoat C unit was added to the coating machine.

The BM 2 is a four-ply, fourdrinier machine with a wire width of 4,300 mm and produces boards in a basis weight range of 210 - 400 g/m^2. A maximum operating speed of around 550 m/min is available, while the design speed of the new parts amounts to 650 m/min. The machine was originally built in 1994.

Coating gets a boost

The brand new DynaCoat C reinforced three Combiblade coating units. It was installed in the second position and will be used for preliminary, reverse side coating.

DynaCoat represents the latest generation of Voith Paper coating units. Following Voith Paper's takeover of the Jagenberg company, there was an overlap in the companies' portfolios and therefore a modular coating system with the name DynaCoat was developed from various other units.

Coating experts from both Germany and Austria were involved in the development work, which was completed in around six months of intensive

The DynaCoat C, IR-dryer and HCB-Turn can be installed in very limited space

APP Ningbo has its headquarters in Duantang

activity. The proven characteristics of the CombiBlade such as the positioning of the framing, the emptying of the color return pan and practical access were all retained and combined with other successful, existing functions, e.g. the hydraulic movements used in Voith Paper coating units. Another interesting feature is formed by the rolls, which can be reused in case of a redesign of the CombiBlade.

Moreover, extended plant pre-assembly means that the new DynaCoat C offers short upgrading times. The unit also requires less space than comparable equipment and its modular design facilitates simple conversion.

Design and development engineer of Voith Paper, Roland Scheiflinger, describes the most important unit improvements as follows, “In a nutshell, DynaCoat C simply offers higher performance than previous units. It should be noted that the control functions have been optimised and the unit offers a higher safety standard due to faster, more reliable movements and optimum access. New hydraulics make maintenance easier to complete and the appearance is cleaner.”

The first, but not the last

The DynaCoat C (C stand for Compact) is the baby brother in the coating unit family. At present, it can be used for paper machines with widths of up to 6,000 mm and maximum speeds of 800 m/min. The larger DynaCoat AT (Advanced Technology) version is used for wider and faster paper machines and both DynaCoats are suitable for all types of coated papers and boards.

APP Ningbo runs the coater in blade operation, although conversion to rod operation is possible if so required. The standard DynaCoat C is fitted with coating rolls, but for machine speeds in excess of 800 m/min, a jet coating system or a JetFlow F can be used.

APP Ningbo is the first name on the DynaCoat C reference list for board grades, but in the meantime a second unit has been put into operation in Spain. Furthermore, the DynaCoat AT also has a number of references. Voith Paper project engineer, Kurt Eichinger, “It was not an easy decision for the customer to be the first one to utilize this unit, but the trust has paid off. The BM 2 is running smoothly and APP is completely satisfied, as all targets have either been met or surpassed.”

Other modifications to the BM 2

Apart from DynaCoat C, other components such as infrared dryers, HCB-Turn resp. hot air dryer have been added to the coating machine. The HCB-Turn is a device, which can turn and dry the paper at the same time and is thus ideal in the case of upgrades in very limited space. Accordingly, this Voith Paper Krieger unit is in great market demand.

Ningbo now operates four coaters and can, therefore, produce first class art board

The market demands top quality

Lin Xiao Zhen, the head of the Maintenance & Engineering Division, was in charge of the rebuild project

twogether: A few months have passed since the completion of the BM 2 rebuild. When you consider the project as a whole, which activity stands out most in your mind?

Lin Xiao Zhen: "We are very happy with the rebuild, for which we only had to shut down the machine for a short period. During the entire project completion process, we enjoyed the excellent cooperation with Voith Paper. We really did feel in safe hands the whole time and above all, during the intensive conversion work phase, we appreciated the first class service provided. We have benefited from Voith Paper's clear instructions regarding the installation and start-up of the new components, for as a result, commissioning was completed without a hitch.

twogether: What customer feedback have you received?

Lin Xiao Zhen: A thoroughly positive response. All the market requirements have been met and we have attained our quality objectives. Our markets demand top quality board. With the upgrading of the BM 2, we have consolidated our position as the quality leader in the ivory and art board production segment.

Voith Paper also supplied other components to Ningbo for quality enhancement purposes. Two MSA screens were added to the approach flow system for the middle ply, one for the first screening stage and the other for the dilution water line. Both are fitted with slotted C-bar screen baskets and in order to optimize the cross-directional basis weight profile, the existing middle ply headbox was supplemented by ModuleJet dilution technology with Profilmatic M-control.

A DuoShake shaking unit improves formation and the MD/CD ratio of the base board. Furthermore, the BM 2 also received various dewatering units and an offset press in the fourth position enhances base board smoothness.

Last, but by no means least, the scope of deliveries from Voith Paper included a comprehensive automation package. This consists of the OnControl process control system with hard- and software based on the PCS7 standard for the coater, infrared dryers and HCB-Turn.

The rebuild of the board machine was completed in minimum time. Following a short shutdown of less than ten days in May 2007, APP Ningbo was able to start art board production on schedule. For a project of these dimensions, this was very tight timescale.

Art board now constitutes 50% of BM 2 output. Many of Ningbo's customers are located in China, but the company exports around the world. This means that board from Ningbo can be found everywhere from Europe, the Middle East and Asia to the USA and Canada. Therefore, when reading high-quality glossy brochures, it is worth remembering that the cover could come from Ningbo.

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The 1st tambour was wounded on 30 March, 2007

Yuen Foong Yu has China's first PerfectFit paper machine

YFY steps up Chinese testliner production

Are you looking for environment-friendly containers for French fries, solid board for children's books, or wedding cards with the sheen of mother-of-pearl? Or how about some tissue or testliner? Whatever is required, one can count on YFY Paper, which with a new paper machine, is now providing the Asian market with 280,000 t of packaging papers yearly.

Yuen Foong Yu Paper Manufacturing Co. Ltd. in Taiwan is a very versatile paper maker. Founded in 1926, the company can look back on a long tradition of paper production in Taiwan, China and Vietnam. YFY entered the paper business as early as the end of 1930's and was the first company to start paper R&D in greater China. In the meantime, it has three business units comprised of fine paper & board, household papers and industrial

The paper mill of Yuen Foong Yu Paper Manufacturing Co. Ltd. in Yangzhou, province Jiangsu, China

papers. As a consequence, the company offers a huge product range. Today, YFY is the largest producer of testliner and fluting in Taiwan and operates a total of 17 different paper mills.

In addition, another two paper mills from a joint venture with the Vietnamese government are scheduled to join the group in the near future.

High quality on 3-plys

YFY's newest paper machine started production in the Chinese province of Jiangsu at the end of March 2007. The PM 2 mostly produces high quality testliner in the basis weight range of 125 - 280 g/m^2. Furthermore, the product portfolio includes lightweight corrugating medium grades and kraft liner.

As is frequently the case with high quality testliner machines, the design of the PM 2 includes three fourdrinier wires for the maximum utilization of fiber potential. The paper machine has a wire width of 5,360 mm and has been designed for a maximum production capacity of 900 t/d. The design speed is 800 m/min.

In the press section, two stand-alone presses guarantee the highest dryness levels at maximum bulk. The configuration consists of a jumbo roll press in the first position and a NipcoFlex shoe press in the second. This combination not only ensures efficient drainage, but also minimum volume reduction.

The entire pre-dryer section and after-dryer section are of double-tier design. The only exception is the first group, which is single-tier. Voith Paper had the objective of combining the most effective drying with the best possible runnability.

A SpeedSizer unit provides uniform film application and the machine concept is rounded off by an EcoCal calender and a MasterReel. Parent rolls of up to 3 m diameter can be wound without quality losses.

In form for the future with PerfectFit

The PerfectFit concept played a major role throughout the PM 2 project. The central idea behind this concept is the definition of the "nice to haves" and essential equipment.

Wet end and beginning of the press section before ...

... and four months later

A comparison with cars provides an excellent analogy. Trips in cities on asphalted roads do not demand a four-wheel drive pick-up with a cow catcher, a winch and three extra pairs of lights on the roof. Conversely, in heavy urban traffic, air conditioning, a navigation system and parking sensors are more important. The same logic applies in the case of paper machines designed according to the PerfectFit concept.

An intelligent configuration, i.e. not everything was selected that would have been possible, was determined on the basis of a long checklist. This was prepared in conjunction with the customer and made no compromises with regard to performance and quality. The customer objective of making sure that the PM 2 could match future needs took center stage in this equipment selection and for example, the MasterJet II F/B headbox on the back ply can be upgraded with a ModuleJet dilution control system.

Another example is provided by the SpeedSizer, which is currently used for single-sided starch application, but can also be simply adapted for double-sided application.

In addition to fundamental decisions, the PerfectFit checklist also contained detail questions. One of the decisions was e.g. if the combination of a jumbo roll press and single shoe press would suffice – meaning that a tandem shoe press was not required. The response in the case of the YFY PM 2 was positive. Moreover, the need for the oscillation for every single shower was also discussed.

No compromises with regard to performance

The omission of some components in the case of the PM 2 clearly did not mean sacrificing the best possible runnability. For example, Fibron conveyors were chosen for the tail transfer instead of the usual ropes.

Chia-Feng Yeh, the customer's project engineering manager, is very happy with the results, "The PM 2 is a good machine with good engineering."

YFY has already been running its entire product range and has reached the planned maximum production capacity. This status was attained just five months after start-up. The quality of paper is stable and the mostly Chinese end users are also satisfied.

Contact

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A special challenge – the Fors rebuild

The 8 mm success factor

The Fors BM 2 machine rebuild presented the team from Voith Paper and Stora Enso with a daunting challenge. Working with millimeter accuracy was required and provided in masterly fashion.

Located in the heart of Sweden, Fors is a globally respected board mill, which produces coated FBB in a grammage range of 180 - 400 g/m^2. This is used as packaging for cigarettes, chocolate, confectionary, frozen food and luxury products.

As a leading supplier of premium boards, Stora Enso defined the success of the machine rebuild as depending upon three factors.

These consisted of increased product quality from their three-ply BM 2, improved cost efficiency and greater production range flexibility.

Board of first-class quality has been produced within shortest time

To achieve these goals two old headboxes were updated with MasterJet II F/B and the approach flow received three new screens. Due to the very low basement height, two Voith Finckh screens had to be installed horizontally, which made the work considerably more difficult. The scope of delivery also encompassed the related pumps, a suction couch roll, a Hydromix mixing collecting pipe, detail engineering and installation.

Tight spots for tried and tested teams

When the BM 2 was originally conceived in the early sixties, the designers did not give much thought to future rebuilds. As in many other mills, both the basement and the machine hall are very low. Therefore, the question was how could one disassemble the old machinery and install new systems when simply no space was available?

The biggest obstacle was clearly posed by the back ply headbox. This was located in the very center of the wire section, underneath the middle ply with the white water tray and a machine beam. At the back

The installation of the back ply headbox was a real challenge

The new headbox under working conditions

was a concrete wall and the machine piping.

A tape measure is needed in every rebuild, but in the case of Fors BM 2 it was employed intensively. The crews were not only looking for every half-meter or centimeter. In fact, everything came down to just 8 millimeters.

These problematic circumstances presented the Voith Paper crew with some really spine-chilling moments. Helmut Eigner, the installation foreman, will certainly never forget this rebuild.

"It was a huge technical challenge. Whether above, below, left, or right, there was no free space anywhere. When we shifted the back ply headbox into the machine, we had exactly 8 mm of headroom. I couldn't even squeeze my little finger into the gap."

Helmut Eigner has been installing paper machines for 15 years, but Fors was his toughest task yet. As he explains with a smile, "It was a real thriller! I think that some people did not really believe that we could fit the headbox until they saw it happen for themselves." As far as his contact partners from the customer side are concerned, he has nothing but praise, "Both the project manager and his team were highly professional and cooperative."

The Fors headboxes are not of special design, but are standard F/B units. Due to their compactness, the passage behind the headbox is now wider, which makes cleaning easier. A larger headbox would have caused enormous problems and demanded the removal of the middle ply white water tray. This would have prolonged the rebuild by three or four days. However, no adaptation work was needed and this is certainly one of the major benefits provided by Voith Paper.

Not only was there no room to spare for the back ply headbox, but also for the top ply headbox and the PD tanks. Nevertheless, in spite of every event, both expected and unexpected, the rebuild was completed during a 9-day shutdown. The BM 2 started up on January 2, 2007 and immediately provided saleable board quality.

Soft covers, hard facts

However, this did not mean that the rebuild was finished. The upgraded BM 2 needs a new winder that could be used at higher speeds. The Vari-Flex M two-drum winder has a maximum speed of 2,500 m/min and also offers top winding quality, and it was these characteristics that persuaded Stora Enso.

In general, coated board constitutes a considerable winding problem and in the past, the steel drums caused numerous headaches, among which markings, shiny spots and loss of bulk were the most frequent. Moreover, the limitation on the maximum winding diameter was no less important.

In particular, the shiny spots resulting from layer shifting during winding had to be avoided and reduced to a minimum in order to maintain top quality

production. To achieve this goal, the winding bed has to be soft enough to handle the paper rolls gently, while at the same time, possessing sufficient stability to cope with vibrations. Moreover, the elastic drum covers have to be abrasion-resistant enough to exclude the formation of dust.

Due to the enormous leap forward made in roll covering technology in recent years, covers can now also be used for coated board. Moreover, the retrofitting of steel drums with new covers is also possible.

In the case of the Fors BM 2, the suitability of the elastomer-covered ElaCare drums was demonstrated during extensive tests at Voith's Paper Technology Centre Finishing in Krefeld, Germany. The tests were subsequently confirmed by visits to reference installations.

Apart from the ElaCare covered drums, the VariFlex offers a full range of technical features, such as a slitter section composed of cutter units that can operate without a trailing cable installation. Cutting and surface dust extraction systems, as well as a newly developed system for automatic start and end gluing, are also of special note.

The icing on the cake is provided by a roll conveying system, which will be installed behind the new winder, and provides gentle roll transport.

A VariFlex winder, seen here during pre-assembly

Customer Comment

Bengt Andersson
Production Manager
of Board Production
Stora Enso,
Fors mill, Sweden

Bengt Andersson has been watching the results of the rebuild for roughly a year and sums up as follows.
"We have improved both formation and fiber orientation angle, which means that our targets have been accomplished.
I should add, that I never doubted that the headboxes would fit!"

As often happens in the industry, the BM 2 was converted during a vacation period, which in this case was Christmas. Naturally, Bengt visited the rebuild site daily, but what did his family think about that?
"My family is used to it. After all, I have been working in the paper and board industry for more than 35 years and such things are part of the job."

It would appear that this tradition is set to continue for some time in the Andersson family, as Fors has already ordered a DuoShake unit for the middle ply and the installation of a calender upstream of the coating section is also planned. "God Jul", "Happy Christmas", BM 2!

Contact

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Robert Kling

Personal data:
Robert Kling from Voith Paper in St. Pölten, Austria, is an expert on the subject of chemical and mechanical press felt cleaning.

Chemical press felt cleaning in the press section

Felt washing for clean clothing

The felts used in a paper machine press section are subject to extremely stringent demands and must ensure both optimum dewatering and production process stability.

twogether: In cooperation with the Kolb chemicals company, you prepared a comprehensive study concerning the cleaning of press felts. Your research also deals with felt contamination. Could you tell us what effects these contamination have?

Robert Kling: The batt fibers act as a type of filter and retain impurities from the production process. This is unavoidable, but such soiling can lead to a variety of problems. In most cases, these relate to a loss of paper quality, while another phenomenon that can be observed is sheet crushing.

Sheet stealing is another negative side-effect: the paper web has the tendency to suddenly run in the wrong direction in the press. However, the greatest disadvantage for the papermaker derives from the fact that contaminated felt has negative consequences on paper machine runnability. Press dewatering can deteriorate, which leads to an upward trend in the number of sheet breaks. Increased vacuum in the suction rolls and uhle boxes leads to higher energy consumption and felt wear. Should these problems become acute, the only solution is a felt change. The resultant additional shutdowns naturally result in production losses.

twogether: Today, chemical felt washing is indispensable for papermakers. What is the basis for the choice of chemicals?

Kling: There are a couple of general rules, e.g. calcium carbonate filler can often be easily removed with acid cleaning agents, while alkali agents are normally the best solution for organic contaminants. However, the most suitable cleaning agent in practice must be established in the course of laboratory testing. Frequently, it becomes apparent that optimum cleaning results are achieved through a combination of diverse cleaning phases. It is also interesting that the average consumption of



cleaning chemicals varies considerably according to paper grade. In the case of tissue, specialty papers, board and packaging, it can be assumed that around 250 g of chemicals per metric ton of paper will be needed for felt washing. Conversely, only 50 g/t are needed for graphic paper. This discrepancy mainly derives from the fact that there are many graphic production lines where no chemical washing is carried out, largely due to the clean raw materials employed. During the optimization of felt washing, we work closely with the chemicals supplier of the respective paper mill.

twogether: What are the most frequent causes of the problems that occur?

Kling: There are a number of typical risk factors. For example, overdosing with chemicals, or badly coordinated dosing points in the approach flow constitute one such problem. In general it can be said that care must be taken to ensure that the most uniform conditions possible are created in the approach flow and the paper machine. This applies to the pH-value, retention and water hardness. Grade changes are especially critical, if they are linked to alterations in the chemicals system. When we work with paper mills, we naturally look for such critical points. This often means that a considerable percentage of depositing can be prevented. Clearly, this approach should first be tried and only then should the question of how contamination can be removed from the felt be considered.

twogether: What methods are available for felt washing?

Kling: Felts are always cleaned mechanically, i.e. with high- and low-pressure showers and uhle boxes. Chemicals merely play a supportive role. In principle, one can differentiate between a continuous felt treatment with chemicals, which is relatively rare, and discontinuous treatment. Occasionally, the felts are subjected to discontinuous treatment, which can be done either during production or shutdown. However, the most frequently applied method is cleaning during a shutdown. This offers the advantage that negative effects on production are avoided and the felt can be treated with relatively high concentrations.

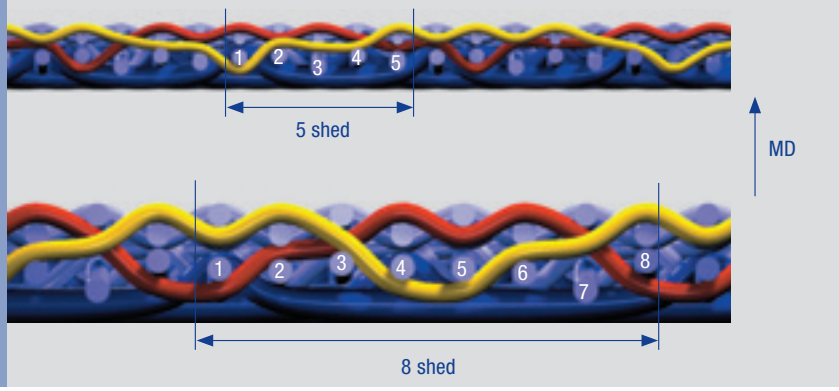
twogether: What recommendations do you have for paper producers with felt contamination problems?

Kling: A number of aspects require consideration during felt washing optimization, e.g. the position of the showers, the choice of chemicals and the coordination of subsequent cleaning steps. Clearly, the design of the felts plays a major role how easily the felts get dirty and then can be cleaned. In many cases, the best solution is when answers are sought during close cooperation between the paper mill and its suppliers of chemicals and clothing. I think this offers the best chances that paper quality and paper machine runnability can be noticeably improved.

Class coarseness	Super fine	Fine	Medium	Coarse
Market name	HS	HQ	HR	HC
Mnemonic	Super fine (S)	Quality (Q)	Robust (R)	Coarse (C)
Market types*	W/Y	X/W/Y	W/Y	W/Y

*1:1 = X 3:2 = W 2:1 = Y

Horizon SSB weft-bound product range overview



8-shed machine side HR and HC

The new PrintForm/MultiForm Horizon product range

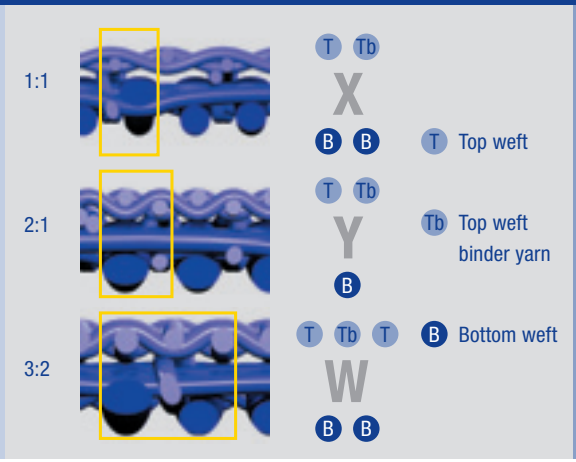
Expand the operating window

Within a period of three years time, Voith Paper Fabrics has developed a complete new Horizon SSB weft-bound product line. The new fabrics cover the entire product range – super fine, fine, medium and coarse designs.

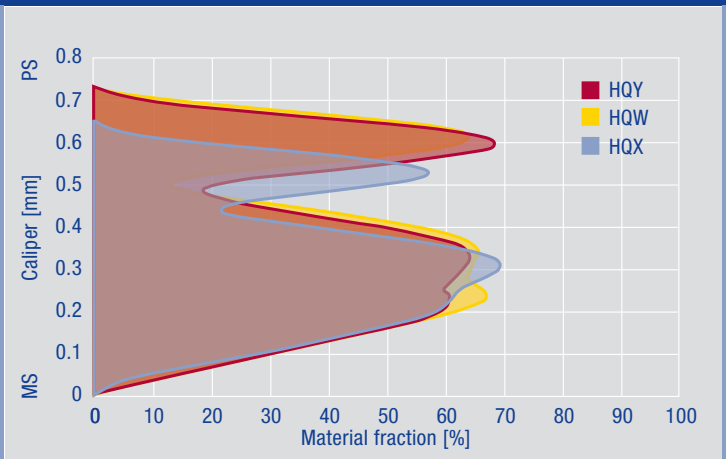
In 2004 Voith Paper Fabrics set in motion the development of a new Horizon product range for the European and Asian markets. The first two new product groups developed were the fine HQ and the medium HR. These were officially launched in April 2006. Currently the development of the coarse HC and super fine HS has reached their final stages, and market launches are expected in June 2008 and March 2009, respectively. The reason behind the development of an entirely new Horizon product range was to serve the present and the future demands of you, the papermaker as well as developing a coarse product for the board and packaging market.

New product philosophy

The new Horizon SSB designs clearly distinguish themselves from the old designs. Significant differences in warp yarn diameters between top and bottom side are applied. The old product contained a machine side warp yarn that was 0.04 mm coarser than the paper side warp. The new Horizon designs differ by 0.06 mm in the super fine HS and fine HQ designs and 0.08 in the medium HR and coarse HC. These changes have proven to provide a positive impact on paper quality, as well as contribute to stability and life potential properties.



Three paper side versus machine side weft yarn ratios utilized



Different dewatering properties X, W and Y versions

A further change in philosophy is the opening up of the warp density. With this change, more weft yarns can be applied in the woven structure. This has a positive effect on the paper side fiber support, contributing to paper quality and retention aid savings, as well as the number of machine side weft yarns, increasing the fabric's life potential.

To even further increase the life potential of the medium HR and coarse HC designs, where life is a crucial success factor, a 2-shed paper side with an 8-shed machine side has been applied, rather than the typical 2-shed paper side and 5-shed machine side.

The high 8-shed machine side gives the fabric long cross directional floats, which well protect the warp yarns against wear and also equip these designs with 75% more life potential versus the 5-shed machine sides.

Differentiation within product groups

Within the individual four major product designs, further product differentiation has been reached by applying different weft yarn diameters and weft yarn ratios between paper side and machine side.

Applications of bigger weft yarns give the Horizons more life potential and stability. On the other side, contributions to most of the paper quality issues are negatively influenced. This is a compromise that is decreased with a Horizon design compared to older double-layer designs, but still is an existing one.

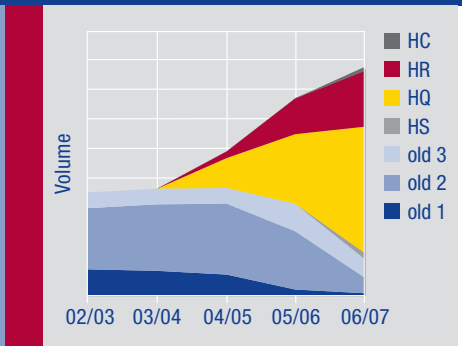
The three utilized weft yarn paper sides versus machine side ratios are 2:1 (Y), 3:2 (W) and 1:1 (X). Each of these three ratios has its own characteristics. The Y-version gives a structure with maximum quality contribution and a good life potential. The X-version results in the thinnest design and holds a low void volume. The W-version is the best compromise between quality contribution and life potential.

The various weft ratios also influence the dewatering properties. Together with the different weft density versions available, this creates the possibility to fit the new Horizons to nearly every individual customer position and related needs.

Tested in the PTC

The Voith Paper Technology Center (PTC) trial paper machine VPM 6 has been a big help in the development of the new Horizon product range.

The ability to push a product to the outer borders of its operating window has supported the quick development and a risk-free initial application of these products on real world paper machines.



Sales volume development per financial year

Current status

Three years after the start of the SSB development plan, which represents the idea to create a whole new Horizon product line, it is clear the right decision has been made. Even with only half of the product range now commercially available (launch of the HQ and HR), production volumes have already more than doubled.

At the moment, the finishing touches are being made to the super fine HS and coarse HC designs. Field trial runs of the HC have shown only positive performances so far. Nothing looks to be standing in the way of the intended launch in June 2008.

Trial runs with the HS have been made on the VPM 6 up to a speed of 2,500 m/min! The HS showed no problems handling the water and/or contributing to the delivery of good quality paper. The first HS customer piece was installed on September 25, 2007. It performed very well with regard to contribution in paper quality and paper machine runnability. Voith Paper Fabrics is now seeking another five trial positions. If these all go well, the HS launch will be executed in March 2009.

The nearby future

Being close to the point of commercializing the last two Horizon products, already new ideas are being developed by R&D. The latest idea can truly be called revolutionary: HM. Firstly it has the possibility to expand the operating window even more than the SSB weft-bound did when it was introduced on the market around 1999. Secondly, it will hold a global application.

This new concept will be tested on the VPM 6 in the spring of 2008, and we expect final analysis to show that it outperforms even our own expectations.

The close collaboration between Voith Paper Fabrics and the other Voith Paper group divisions makes us a very strong team when it comes to optimization of paper machines. Our One Platform Concept enables us to bring any solution to our customers. The new Horizon product range is another step closer in never letting down any of our Voith Paper customers.

Infobox

The products HS, HQ, HR and HC are only available in Europe and Asia.

Contact

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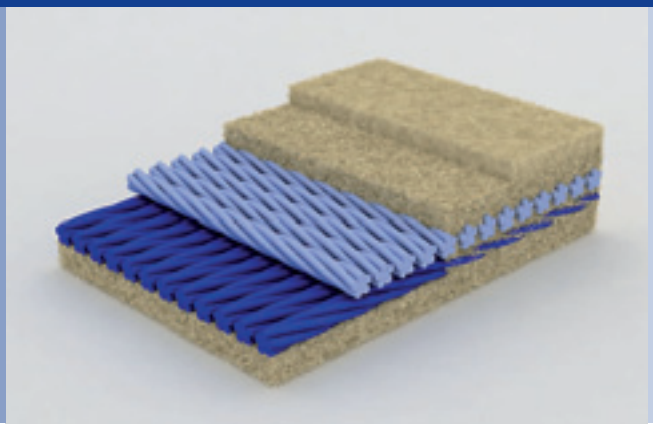
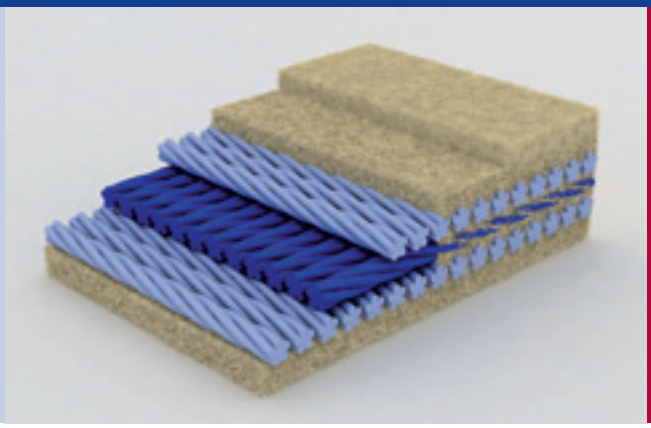
Tested in the PTC – the new Horizon product range



PrintFlex O2 Planar



PrintFlex O3 Planar

One more step in the development of non-woven press fabrics

Combining established and new technology

Voith Paper Fabrics takes another major step towards extending the application range for non-woven press fabrics. In the new press fabric concept non-woven yarn systems are combined with and integrated in other exclusive components offering unique press fabric properties.

Double- or multi-layered non-woven press fabrics have been marketed for about 15 years and are today established standard products for many press section configurations, especially on graphic machines.

Compared with conventionally woven base structures, the non-woven concept has several clear advantages as, even pressure distribution thanks to the lack of yarn crossing points and faster startup due to the low initial pore volume.

The low void volume of the base structure and the lack of yarns in the Z-direction limit however the compaction resistance of products currently on the market and thus prevents them to be used in all kind of positions in the press section.

With the unique combination of Voith Paper Fabrics Vector and Spectra components with length and cross-directional yarn systems, the range of applications for non-woven products can be extended to such an extent that they can now be used on virtually all press positions.

Integrated components – Vector

With the introduction of Vector technology by Voith Paper Fabrics some years ago, an important step in the development of new press fabric components was taken. The Vector layer's three-dimensional structure is unique as it combines the marking free properties of non-woven components with high compaction resistance and high elasticity in the Z-direction.

Vector – in combination with all types of basic fabrics – contributes to:

- Higher wear resistance due to a stronger fiber bond
- Optimized surface characteristics due to excellent bridging of the base structure
- Higher compaction resistance in the Z-direction
- Reduced flow resistance for more effective dewatering.

Vector modules can be combined successfully with yarn layers in different directions, and thus the above characteristics can also be transferred to non-woven fabrics Vector provides in combination with woven components improved compaction resistance. The same advantages are achieved with PrintFlex V Planar and thus the fabric properties are much better retained through the whole life.

Integrated components – Vector with weft yarn

As a further development step, Voith Paper Fabrics can integrate a MD yarn system into the Vector component through a unique manufacturing process.

In addition to the characteristics listed above, the plied monofilaments in the machine direction serve for a greater tensile strength, which enables use as a stand-alone component that in turn can be successfully combined with one or more cross-directional yarn structures.

Elastomer technology

Since introduction of elastomer technology as a complement to conventional woven structures, Voith Paper Fabrics was able to maintain its market-leading position for membrane fabrics, and even extend its lead.

Polyurethane membranes have the following advantages compared to conventional press fabrics:

- Improved dimensional stability
- Higher dry content due to higher compressibility and fast expansion after the press nip (lower re-wet)
- Faster startup thanks to excellent compressibility of the fabric
- Excellent vibration resistance
- Very well retained properties through the whole life due to the unique material characteristics of polyurethane.

The illustration shows how well the polyurethane membrane keeps its thickness and shape after the record run in a fourth press (1,650 m/min, grooved steel bottom roll, line load 140 kN/m). The ability of polyurethane to maintain its characteristics is the key to the success Voith has achieved worldwide with this fabric type on fast-running graphical paper machines.

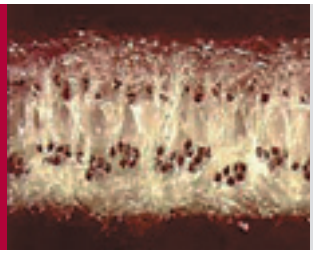
The elastomer technology proves especially successful in extremely demanding positions where conventionally structured fabrics quickly compress due to high line forces, hard rolls and high speeds. This can result in vibration problems and short fabric life. The picture of the polyurethane membrane shows an example of how the Spectra elastomer technology contributed in reducing vibrations and thus improves runnability in a high speed paper machine.

Elastomer technology in combination with non-woven yarn structures

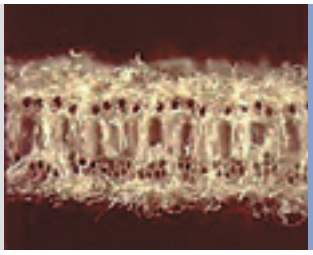
The possible combination of differently oriented non-woven yarn layers with a polyurethane membrane, or the Vector technology, offers the advantages of two different concepts combined in the same press fabric design.

The lower void volume of non-woven fabrics combined with the high compressibility of the polyurethane membrane speeds up the startup even further compared to other fabric concepts. In positions where current

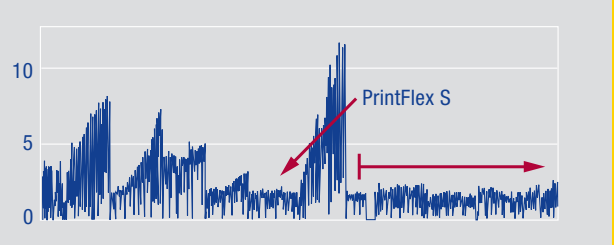
New polyurethane membrane

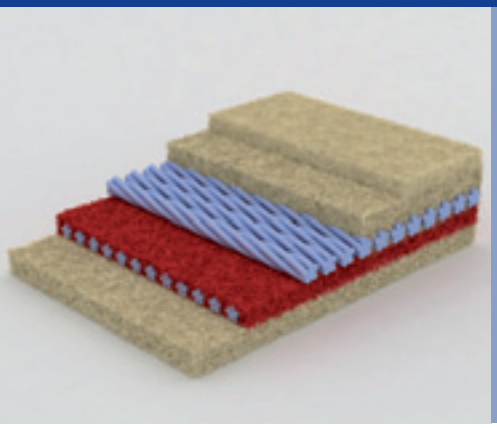


After use

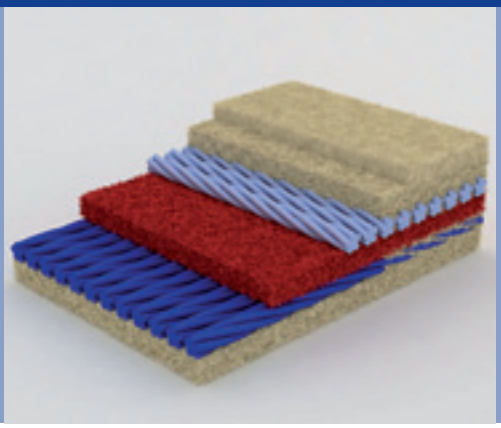


Vibration reduction using Spectra elastomer technology

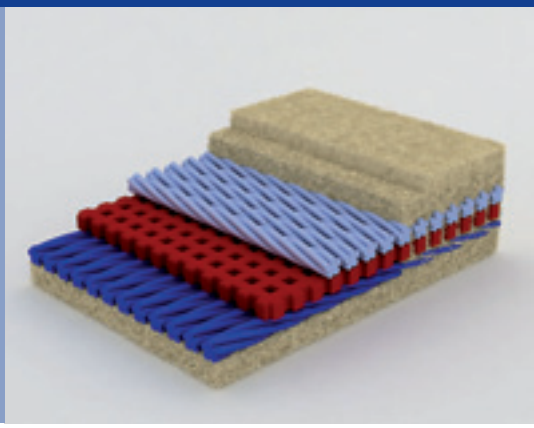




PrintFlex V2 Planar



PrintFlex V3 Planar



PrintFlex S3 Planar

non-woven structures offer too low compaction resistance and thus cause vibrations, the membrane technology now allows for the advantages of non-woven fabrics to be utilized.

In several positions where membrane fabrics with woven basic components successfully have been used, a change was made to non-woven versions. The performance of the machines was thus increased even further.

Reduced risk of roll and sleeve pattern marking

Thanks to the shared resources offered by the Voith Group, product characteristics can be evaluated at an early phase and possible issues can be addressed in due course.

Traditional non-woven fabric concepts with their low initial void volume are relatively often successfully used in shoe presses. Depending on the paper type and its weight, the surface structure of the shoe press sleeve can leave markings. In cooperation with the Voith Paper QualiFlex department, studies with different fabric types were conducted to determine the probabilities of structured press cover surfaces to leave markings. The result clearly showed that non-woven fabrics with Vector or Spectra components greatly reduce the risk of markings considerably compared to standard non-woven fabric types currently on the market. The differences become even more pronounced when comparing fabrics that have been run in the paper machine.

Summary

Voith Paper Fabrics offers the first-ever complete product range of non-woven press fabric products with its development of new, integrated press fabric components and unique combinations of non-woven structures from different materials with different characteristics:

PrintFlex O2 Planar

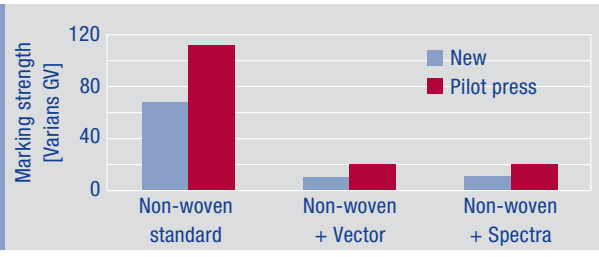
PrintFlex O2 Planar runs ideally on lower press loadings and mainly supplies graphical shoe presses.

PrintFlex V3 Planar

The open structure of PrintFlex V3 Planar is suited for higher press loadings with enlarged water outcome. In addition, the integrated Vector technology enables optimal cleaning.

PrintFlex S3 Planar

PrintFlex S3 Planar ideally runs on vibration-prone positions with higher press loadings. The unique Spectra Module is able to compensate for machine-related failures and irregularities in most areas.



Shadow markings from grooved shoe press sleeve

Contact

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Workshop assembly of the EcoSoft calender
Customer: Sun Paper PM 21
Year of Manufacture: 2006
Nip pressure range: 30-150 N/mm
Sheet width: 4,998 mm
Number of zones: 36
Design speed: 1,300 m/min

A new generation of Nipcorect calenders

EcoSoft M and EcoCal M – customized for your products

The latest calender range is equipped with advanced Nipcorect technology. It has been developed for machines up to a working width of 6,500 mm and a design speed of 1,500 m/min and offers excellent profiling possibilities in addition to further reduced energy consumption.

With regard to the demands and requirements of the paper and board industry, Voith has created the One Platform Concept. It aims at making available installations which offer the industry a combined maximum of quality, efficiency, operating safety and environmental friendliness. Thus, a modular system has been established that allows realizing the optimum solution in each individual case. Within the One Platform Concept, calenders obviously play an important role since they determine such important parameters like smoothness, gloss and bulk which have a decisive influence on the end product and ultimately ascertain its saleability. That is the reason why Voith has established a comprehensive variety of finishing means for all the paper and board grades that require calendering.

Recently the product range has been expanded to include EcoSoft and EcoCal calenders incorporating Nipcorect rolls: the EcoSoft M and EcoCal M range.

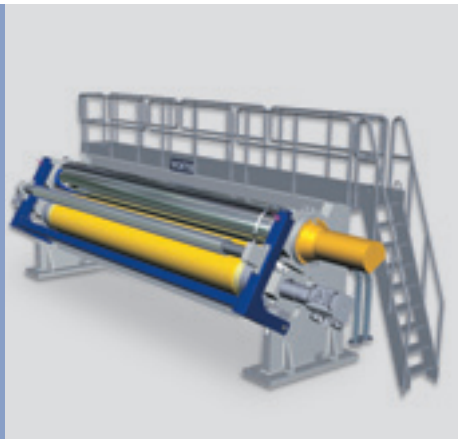
The new variants

The principle component in this new range of calenders is the Nipcorect M with its advanced profiling possibilities – a further development of the Nipcorect zone controlled roll. As a result of individually controlled small zones and appropriate shell thickness they provide for improved CD profile control. Thanks to this, profile corrections can be carried out in the range of 150 mm: a higher resolution than any other calender supplier has previously been able to achieve using this type of technology. Unlike external profiling units, the Nipcorect roll is not energy intensive and does not suffer from a time lag between the detection of a change in sheet caliper and correction response. It can also go back immediately to the previous profile setting after a sheet break or other interruption in production.

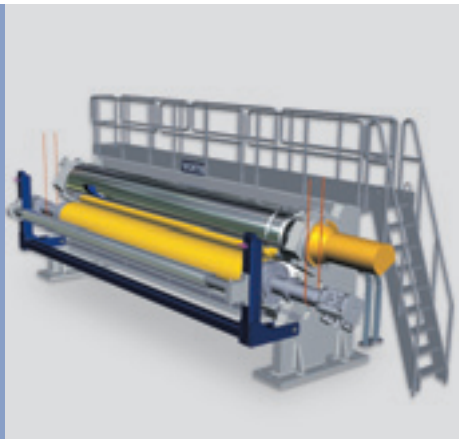
The Nipcorect roll is controlled by Voith's Profilmatic OnQ Module Nip process control software serving as an interface between the QCS scanner and the Nipcorect roll's hydraulic control system. This interface provides for closed loop monitoring and the rapid, automated correction of the sheet's CD caliper profile. The software calculates the setpoint for each control zone in response to a change in overall nip load as well as the correction required for variations in caliper.

Five standard sizes of Nipcorect calenders have been developed to accommodate a range of sheet widths from 2,300 mm to 6,500 mm, a maximum speed of 1,500 m/min and nip pressures between 10 N/mm

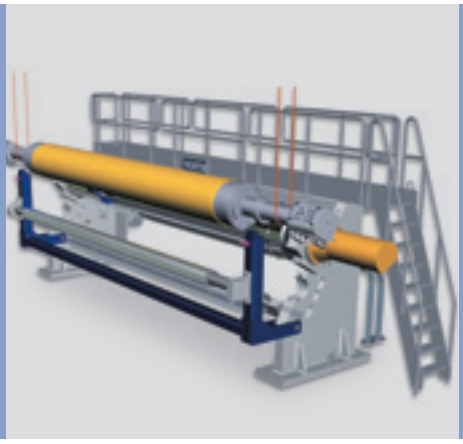
M-Lock functions:
Closed



Opened



Roll removed



to 300 N/mm. These calenders are based on proven designs and use standard and pre-engineered elements throughout the size range to achieve delivery times as short as possible. All calenders are assembled and tested prior delivery to minimise mill-site erection and commissioning times.

The calender frames are designed with a 30° incline to provide the increased stability that is obtained with a low centre of gravity. The compact frame footprint makes the design suitable for retrofitting into most existing paper machines. This design also facilitates the easy removal of the rolls. Where space in the paper machine permits it, these calenders will be offered with the “M-Lock” system on which doctors, spreader rolls and cover monitoring equipment can be mounted: the “M-Lock” arms are rotated clear of the calender to significantly improve maintenance access and decrease the time for roll removal.

The very first EcoSoft M was installed at Papéterie du Léman, Laval, France in 2003. This calender design was a derivative of the highly successful EcoSoft Modular and was sold as a prototype in agreement with the end customer. The installation has been a complete success, with the Nipcorect technology exceeding forecasted performance. As a direct result, the design was refined into the EcoSoft M and EcoCal M calender range.

The number of orders placed with Voith for calenders of EcoSoft M and EcoCal M providing highest CD profiling resolution by using this Nipcorect M technology proves that the paper industry has fully become aware of the benefits which these machines offer.

EcoSoft calender installation at Sun Paper, PM 21

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Rebuilt VariRoll at M-real in Biberist

Modern and dependable again – Voith rejuvenates a 26-year-old VariRoll

High-speed rebuild exceeds customer expectations

Thanks to this rebuild the M-real paper mill in Biberist, Switzerland, can now depend fully on their ageing VariRoll center drum winder. After modernization, this VariRoll is no less reliable and user-friendly than a brand new machine.

With a working width of 5,100 mm, this center-drum winder handles wood-free coated art paper in the basis weight range 45-135 g/m^2 at an operating speed of 1,800 m/min.

Scope and duration of rebuild

This rebuild mainly involved complete mechanical revision at the Krefeld works of all wind-up stations, upgrading the control system to S7-technology, and modernizing the safety and operating concept to the current state of technology. Voith took less than seven days for all this, including dismantling the old wind-up stations, laying 7.5 km of new cables, and troublefree re-commissioning of the rebuilt winder.

Operator guidance for professionals

This new operator guidance concept centers around the well-proven Vari-Tronic control and operating system. It enables for example optimal adjustment and monitoring of the knife positioning, winding hardness measurement and line force generation. Particularly useful is the possibility of storing roll format specifications and winding parameter data. This not only assures faultlessly wound rolls of consistently high quality, but also saves the customer valuable time otherwise needed for winder adjustment.
Mill computer data can also be fed to the system for optimal setting of the VariRoll parameters.

Control desk prior to rebuild

Operating system after rebuild

Ejection of finished paper rolls

The outstanding success of this rebuild project was thanks to rigorous time and cost management, smoothly coordinated teamwork between the customer and Voith, and not least to Voith's enormous experience with winder rebuilds.

All requirements fulfilled

The results speak for themselves:

- Absolutely square paper roll ends,
- Excellent winding hardness structure,
- Faultless paper roll quality

and exemplary controllability as well.

Customer Comment

Martin Stocker
Project Manager
M-real Biberist,
Switzerland

"Our old VariRoll was hardly recognizable afterwards – Voith rejuvenated it so quickly and successfully that all our expectations were not only met but also exceeded. It now produces paper rolls of faultless quality, and the machine is much easier and safer to operate. In a nutshell: our rebuild decision has paid off in full."

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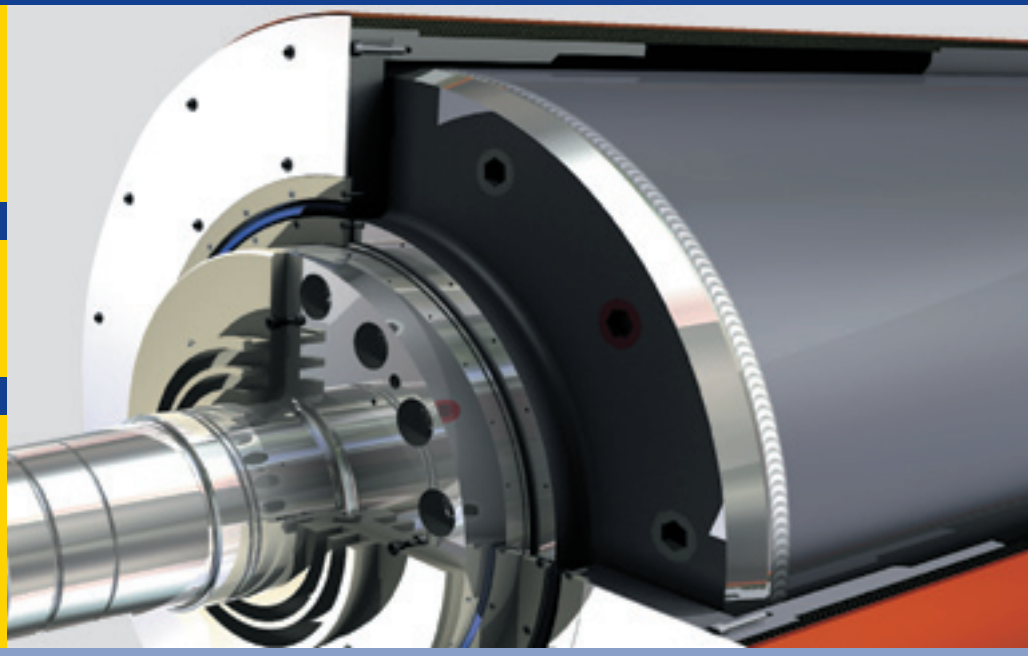
Name	Roll type
EvoTec	
EvoFlow	Suction roll
EvoPress	Press roll
EvoSize	Spreader roll
EvoRun	Paper roll
CarboTec	
CarboForm	Shaken breast roll
CarboRun PG	Paper roll
CarboRun CS	Center-supported roll



Entire roll systems optimized and adapted

EvoTec and CarboTec – the new roll generations

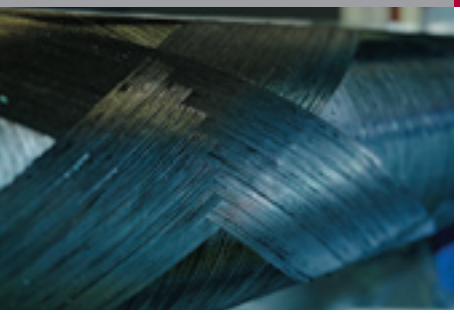
Optimization is an ongoing task in paper mills today. The interplay of rolls, roll covers and related components directly influences paper machine performance. Roll systems require more attention and upkeep than any other part of the machine.

The new-generation EvoTec and CarboTec roll systems incorporate Voith's entire papermaking and roll technology know-how. While the EvoTec product line includes all cast iron, steel and stainless steel rolls, the CarboTec rolls are made of carbon fiber composite materials.

EvoTec and CarboTec roll systems are outstanding due to their innovative details, advanced design – which is customized to specific requirements, and unsurpassed quality. They are built for reliability, safety and long life. All these rolls are manufactured to the highest precision, and meet the most stringent quality standards.

The CarboTec team in Wimpassing, Austria

Carbon fiber composite



Roll production in St. Pölten, Austria

EvoFlow

The new EvoFlow suction roll is based on a well-proven design that has been systematically optimized for maximum dewatering performance and minimal power consumption. Among the other advantages of these rolls, they produce the lowest possible lubricating water consumption and longer maintenance intervals.

Oscillating high-pressure spray pipes, with self-cleaning nozzles are available to avoid plugged suction holes, and the innovative SeaLencer sealing strips system minimizes friction and noise development. All EvoFlow suction rolls are customized to specific requirements.

EvoPress

Reliabe press roll systems are trouble-free and low-maintenance. A failure free operating is mandatory even at highest loads. Therefore EvoPress press rolls are individually laid out according to the latest design methods. Gentle web drainage is ensured even at the highest line forces. For this reason, the roll and cover must be perfectly coordinated. The first-class materials and high-precision manufacturing ensure minimal vibrations and high operating reliability.

EvoSize

Perfect roll concentricity, negligible deformations and high-performance roll cover systems are the main features of EvoSize applicator rolls. No other type of roll reacts so sensitively to temperature effects as applicator rolls do.

Heat generated in the nip by fulling must be safely removed to prevent thermal deformation and cover separation. Voith EvoSize applicator rolls have an effective and dependable cooling system with coolant feed and outlet both on the tender side of the machine. The advantage of this sys-

tem is a uniform water ring of defined size that ensures an absolute homogeneous temperature profile.

EvoRun

The demands on paper rolls range from web support to fabric guiding and driving. EvoRun paper rolls feature high-precision manufacturing and precise dynamic balancing. For balancing in the third plane, patented mountings are used that safely position the balancing weight without weakening the roll pipe. Particular attention is paid to the radial deviation S2 at double the rotary frequency, which directly affects vibrational behavior. Particularly in the semi-critical speed range, a low S2 deviation is imperative for optimally smooth running.

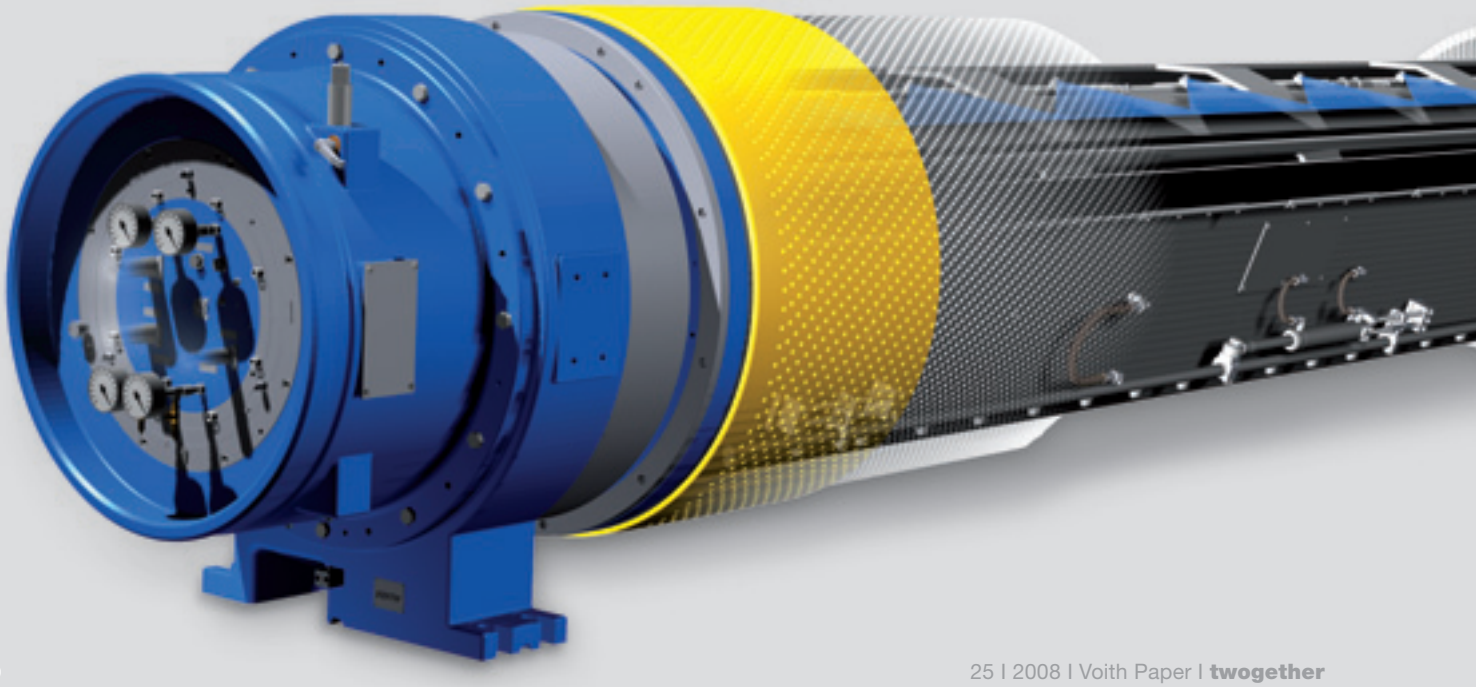
EvoTec roll systems are developed, designed and built by experienced specialists at Voith Paper Rolls St. Pölten, Austria. All our trend-setting roll systems are manufactured using the latest high-precision machine tools.

CarboTec

CarboTec rolls are made of carbon fiber composite comprising two completely different materials: the fiber and the matrix.

The carbon, glass and aramid fibers provide the necessary strength and stiffness, while the resin matrix binding the fibers mainly determines the thermal properties and chemical resistance of the composite as a whole.

EvoFlow



Fiber-plastic composites enable customized roll design thanks to their specific characteristics. Since the characteristics of fiber-plastic composites are anisotropic due to fiber reinforcement, the resultant mechanical properties can be influenced by selecting or orientating the fiber reinforcement accordingly. For example different stiffnesses in the peripheral and axial directions are possible and the thermal expansion characteristics of the roll body can be influenced.

CarboForm

Shaken breast rolls must be lightweight and resistant to deformation. The low weight of CarboForm rolls enables a higher shake frequency, which makes for better sheet formation, and the high specific stiffness or strength of CarboForm roll material is optimally utilized.

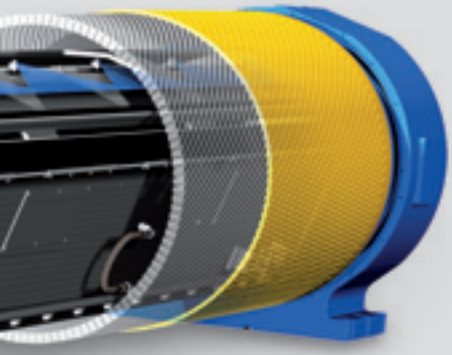
CarboRun PG

CarboRun PG paper rolls are primarily dimensioned according to the natural frequency of the rolls. Their low weight and high specific stiffness enable higher operating speeds than steel rolls. CarboRun PG rolls are used in paper machines, coaters, winders and calenders.

CarboRun CS

CarboRun CS rolls are used in the wire section for wire guidance or spreading. The ideal flexing curve of these center-supported rolls is thanks to an outer tube of carbon composite material. The advantage of these rolls is their combination of low weight and a precisely predetermined bending.

Voith established a new production facility in Wimpassing, Austria, for the entire CarboTec roll family. Depending on application, roll covers or coatings optimally suiting the specific requirements and roll design can be fitted here. The possibilities opened up by carbon fiber composite materials will also be exploited in further development projects.



Customer Comment

Thomas Wischeropp
Klingele Papierwerke,
Weener mill

"Due to the operating situation on our PM 2, which has a single-felted first press nip, nip water drainage was inadequate. This caused sheet crushing and frequent web breaks. Since we needed a new suction press roll sleeve, Voith Paper Rolls worked out with us an optimized drilling pattern both for the roll core and cover. The new surface design now enables reliable drainage, eliminates crushing and has greatly reduced web break frequency, resulting in 2% higher production output. Particularly at the higher end of our product basis-weight range (corrugated board/testliner at 90-180 g/m^2) this optimization takes full effect. In other words, the project goals were reached in full".

Contact

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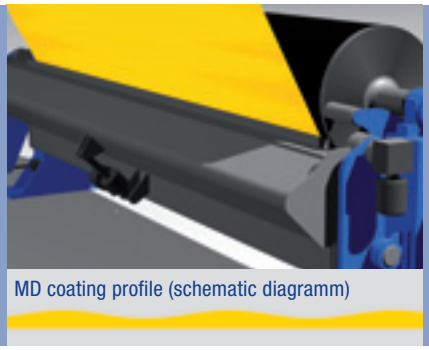
3DG grinding machine

3DG – an innovative Voith Paper Rolls grinding concept

Roll grinding in the third dimension

Rolls ground by 3DG attain such unsurpassed precision that they run better than ever before. The days when eccentricities were transmitted to the roll surface are definitely over.



Lengthwise coating thickness variations caused by coater backup roll eccentricity

Measurement of roll journal geometry

Eccentric rolls can vibrate heavily – and these vibrations are transmitted to neighboring structures and components such as doctor beams and backup rolls. This results in a chain reaction, that affects entire control loops, causing additional loading on the components involved.

The running characteristics of rolls in direct contact with the paper, such as coating or calender rolls, significantly influence product quality. Any deviation in roll concentricity or geometry can cause serious fluctuations in coating thickness or sheet thickness.

3DG can stop this chain reaction at the source by practically eliminating roll vibrations. The neighboring components are no longer affected; resulting in consistant high paper quality.

How does 3DG work?

The procedure starts with high-precision measurement of the roll surface contour and journal geometry. Compared to conventional grinding concepts far more measuring points are used for determining the roll surface contour. And by measuring the journal geometry, any eccentricities can be fully compensated by the control system and no longer transmitted to the roll surface. That is why this concept enables such high concentric precision.

The roll contour measurements are then processed into a 3-dimensional representation of the surface topography, which was previously not possible. This 3D image can, in combination with MD an CD sheet profiles, easily locate errors.

In the subsequent grinding process, the roll surface contour is trimmed to the ideally concentric geometry previously determined. Deviations are corrected by a grinding disk with high-dynamic control. The result is a perfect roll geometry.

Advantages

- Roll-induced vibrations are practically eliminated
- Lengthwise coating thickness variations are practically eliminated
- The MD-2Sigma coating thickness value is almost constant, thus saving coating
- Barring problems are practically eliminated
- Roll life is longer thanks to geometrical precision
- Fault analysis is simplified by high-resolution surface geometry imaging.

3DG has already been successfully used at the Wimpassing and Laakirchen Voith Paper Rolls service centers in Austria. This innovative grinding technology will soon be installed in other service centers as well.

Contact

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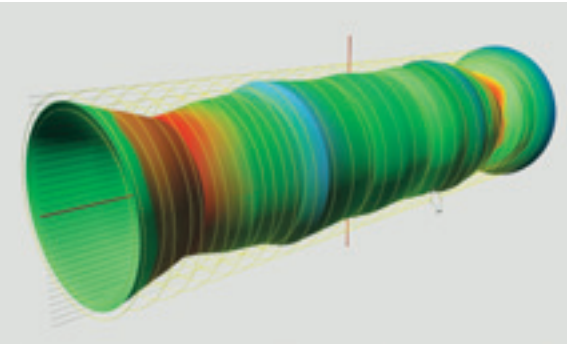
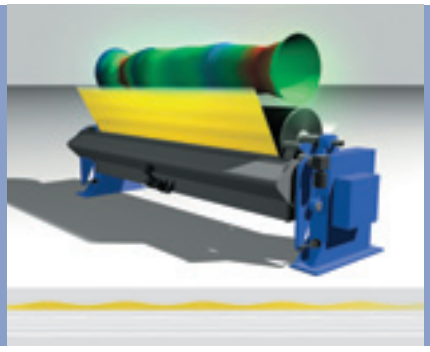
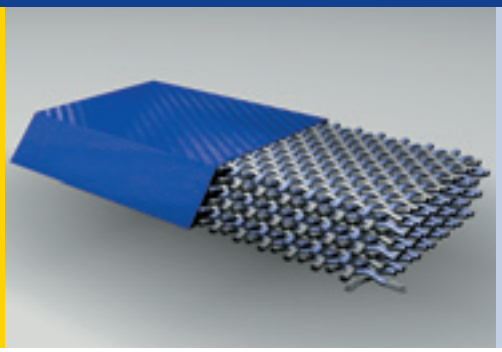


3D roll surface imaging

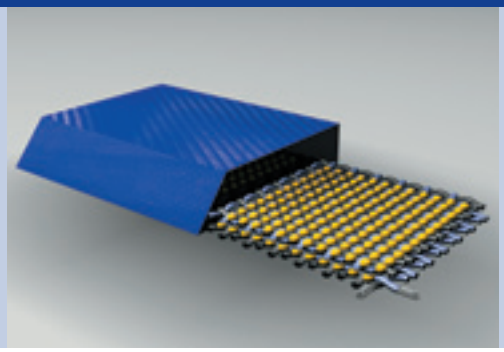


Uneven coating thickness with a conventionally ground roll

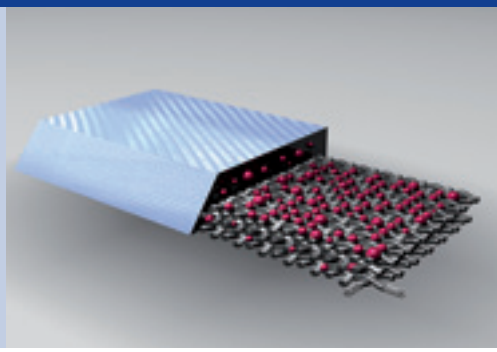
Uniform coating thickness with a 3DG ground roll



SkyComp 40: fiber composite material with at least 40% carbon fiber reinforcement



SkyClean C: fiberglass and carbon fiber composite with finely distributed cleaning particles



SkyTop T: composite of carbon fiber and high-temperature duroplastic matrix with finely distributed cleaning and polishing particles

Cost reductions and greater machine availability

The perfect single-source trio: roll, cover and doctor blades

Voith's vast know-how on the interplay between rolls and covers is now enhanced with the introduction of the SkyLine doctor blades. Thanks to the perfect coordination of all components, they increase productivity and enhance paper quality. Specialized technical support is ensured worldwide by Voith Paper Rolls.

Doctor blades and coater blades are produced and tested from Voith Paper Rolls near Wimpassing, Austria. "It was logical for us to choose this location", explains Dr. Norbert Gamsjäger, R&D Voith Paper Rolls, "because it enables us to jointly develop and optimize doctor blades, coater blades and roll covers. Thanks to our roll cover know-how, we can offer optimized doctors for all applications. Voith Paper Rolls is able to recommend and deliver the right doctor blades for every position in paper machines and for every type and origin of roll cover".

SkyLine doctor blade and coater blade technology is available for all paper machine sections. Voith's de-

SkyLine doctor blades for all paper machine sections (red = commercially available)

SkyLine doctor blades	Application area Wire section	Press section	Dryer section	Sizing & coating	Calender	Reel
SkyPoly	■	■				
SkyTex	■	■	■	■	■	
SkyDur	■	■	■	■	■	■
SkyComp	■	■	■	■	■	■
SkyCarbon	■	■	■	■	■	■
SkyGrid	■	■	■	■	■	■
SkyClean	■	■	■	■	■	■
SkyTop	■	■	■	■	■	■
SkyMet C			■	■	■	
SkyMet S	■	■	■			
SkyMet M		■	■	■	■	
SkyMet B		■	■	■	■	

Voith Paper Rolls service technician changing doctor blade

Checking blade wear traces on site to determine the optimal doctor setting

velopment work focused specifically on fiber composite doctor blade materials and thermal coating of doctor, coater or creping blade. This is the first time in the paper industry that doctor blades have been optimized to precisely suit roll cover materials and surface characteristics.

In order to ensure consistent high quality for dependable paper machine operation, SkyLine doctor blades are manufactured exclusively from first-class materials.

The perfect blade for every application

Voith doctor blades and coater blades are thoroughly tested in the Voith Paper laboratories on a wide variety of covers and paper grades using model tribometers. Based on these test results, the blades and covers are optimally coordinated.

To optimize the fiber composite blade design, the textile and resin contents of material mixtures are systematically varied by Voith Paper Rolls. This determines the cleaning effect and service life of SkyLine products. The various product groups are designed to meet different priorities.

SkyComp products are very cost-effective thanks to their material mix of carbon fiber and fiberglass: they combine the efficient cleaning effect of fiberglass with the durability of carbon fiber.

The service life of SkyCarbon blades is particularly long because their reinforcing material is comprised exclusively of carbon fiber.

For the conditioning and gentle cleaning of ceramic covers, Voith Paper has developed the SkyClean, SkyGrid and SkyTop blades. Each type contains different fillers with different grain sizes. The fillers provide excellent abrasive surface treatment, as well as maintaining surface roughness and efficient paper sheet release. The value of this has been proven on various ceramic rolls in the press section. It has been demonstrated that using SkyTop doctors maintains the surface roughness of ceramic rolls constant over their service life, thus enabling higher paper machine operating speeds and longer roll life.

Voith SkyLine doctor blades have also proved themselves well on roll covers of other suppliers.

Detailed analysis of the doctor blade situation

Using Voith high-performance doctor blades minimizes material losses and improves the doctor blade wear profile. Fluctuations and deviations of the doctor mountings and beams cannot however be compensated by the blade. To identify such deviations and optimize the doctor blade situation, Voith Paper Rolls can carry out detailed investigations.

These investigations show up any doctor system problem, which can then be combated effectively. Furthermore, the analysis does not stop at doctor systems and roll covers, but also examines all influences on doctor operation such as vibrations, roll geometry, etc. as well as the interplay of rolls, covers and doctors.

Contact

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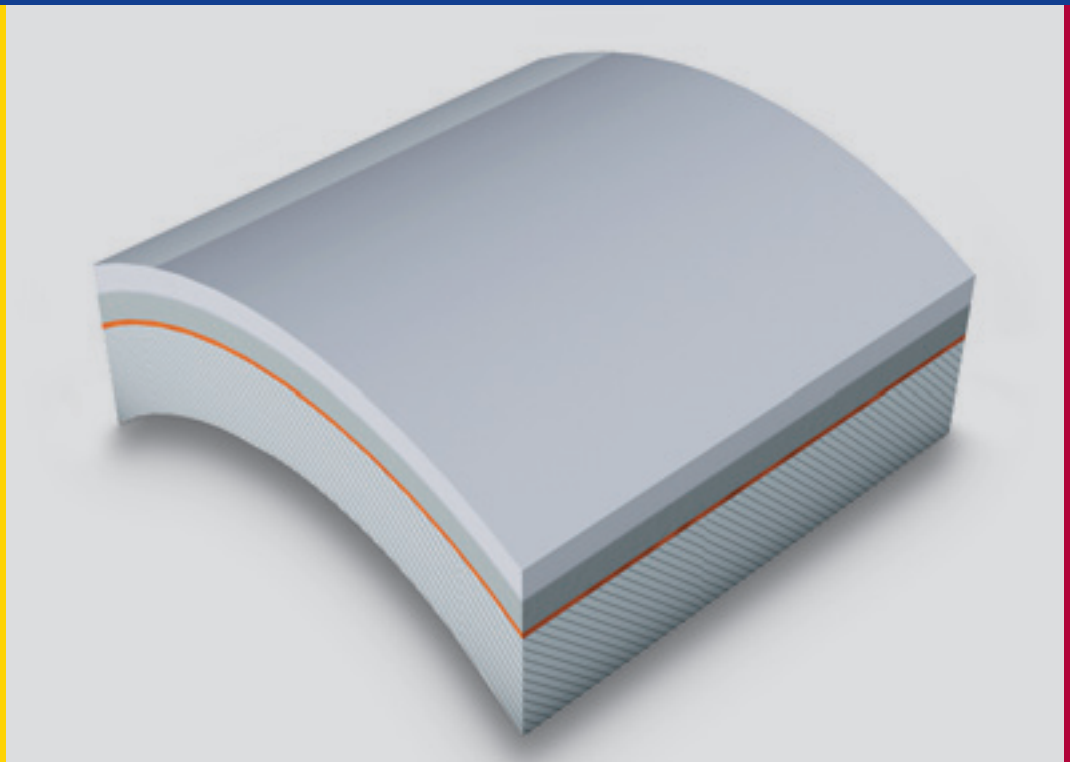

Schematic structure of the NeoSilk calender roll cover

Sizing, coating and calendering with trendsetting technology

New Finishing roll covers

Based on the Voith know-how and using the latest nanotechnology, Voith Paper Rolls has developed a new generation of finishing roll covers.

The past decade has seen a transition from offline to online finishing technology. Simultaneously, the demands on paper machine equipment rose to fulfil the growing requirements of quality and efficiency. Sizing, coating and calendering are all key aspects of the finishing process. To meet our customer needs, Voith Paper Rolls has invested significant resources in the last few years toward developing improved roll covers for the finishing section of the paper machine.

The outcome of Voith Paper Roll's investment can be seen in the launches of SolarCoat, a new polyurethane cover for film coating, and NeoSilk/NanoPearl, new composite cover lines for calendering.

SolarCoat – new polyurethane cover for film press rolls

SolarCoat is the result of extensive tests carried out on Voith pilot film presses, and numerous field trials. The SolarCoat cover combines a hydrolysis resistant shell bonding system and a new polyurethane functional layer formulation optimized for all requirements on a film press.

SolarCoat's features:

- Stable nip conditions are attributed to the elimination of hardness variations and uneven swelling
- very high wear resistance for long running intervals (e.g. the cover reached a running interval of 13 to 16 weeks in two major applications)
- very high wetability for a perfect film formation on the cover
- very high transfer rate for reduced misting and best coating quality
- low rod spitting at very high speed
- excellent dynamic and dampening properties for a smooth, vibration-free run also at highest speed.

NeoSilk – cost-effective composite calender cover

NeoSilk composite covers incorporate all the know-how accumulated by Voith in hundreds of calender applications. NeoSilk covers are cost-effective solutions designed to meet today's demand for conventional and modern calendering applications.

NeoSilk features:

- optimized filler and resin systems reduces wear and abrasion
- minimum grind losses to restore surface finish increases overall cover life
- excellent barring and vibration resistance
- optimized thermal characteristics improves load and temperature capability.

NanoPearl – premium nano-technology calender cover

The NanoPearl covers are the state-of-the-art calendering technology employing an enhanced nano-particle filler system. The nano-particles have been further optimized by introducing a dual component particle system: a hard phase and an elastic modification. These new nano-particles improve strength and stiffness while at the same time provide a dampening effect when impacted. NanoPearl covers are the world-class solution for the most intense calendering applications and highest quality requirements.

NanoPearl features:

- nano-particle fillers allow significantly improved surface finish capability, improve the resulting paper surface qualities and greatly increase wear and abrasion resistance
- dual component nano-particle composition provides improved vibration resistance and enhanced elastic behavior
- heat generation is greatly reduced allowing higher operating speeds and requiring reduced power to operate.

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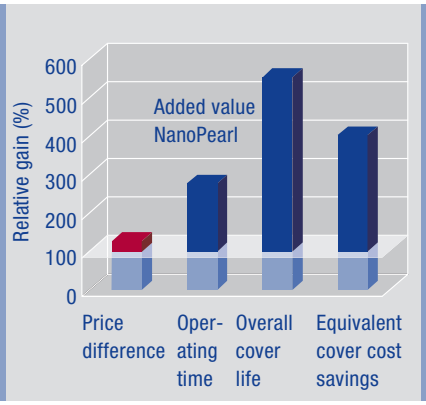
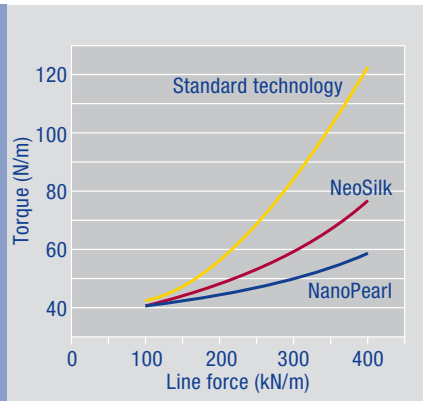
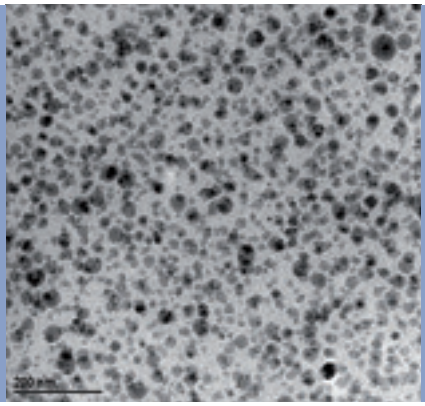
Cost comparison for supercalender application on coated paper



Power consumption reduction



NanoPearl covers with nanotechnology fillers: unrivalled quality for proven product advantages



New fiber test equipment for the press section

Tracking down moisture with FiberXPress

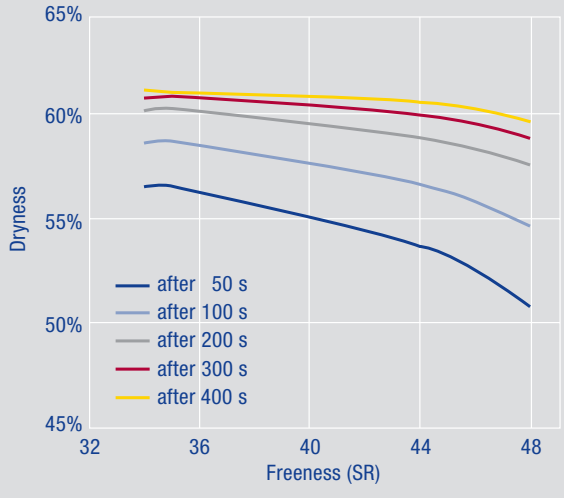
Thanks to the result of the analysis of FiberXPress, the dewatering capacity of a press can be increased and thus the costs decreased.

A high dry content after the press section is always important, because this enables a higher operating speed with greater production output accordingly. Furthermore, it reduces specific steam consumption in the dryer section and consequently saves operating costs.

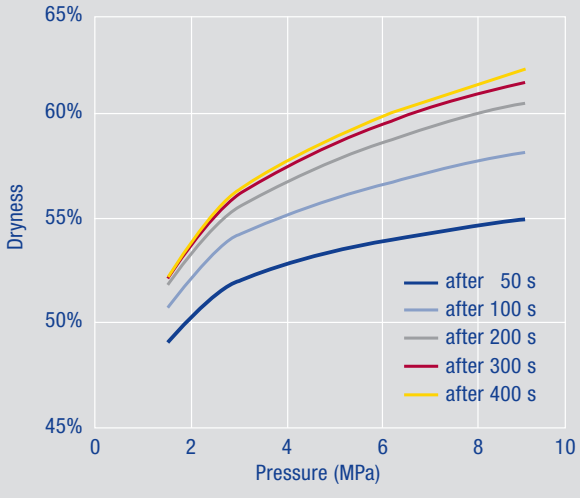
Press-like test conditions

The new FiberXPress test unit, developed by Voith Paper Automation, analyzes stock, usually taken from the mixing chest, in view of its water removal capability in the press section. To this purpose the stock is

FiberXPress enables conclusive analysis of e.g. the effect of freeness in stock preparation, or of different press nip loads on dewatering performance



Dryness (DC) vs. freeness
Recovered paper – FbM 1,500 g/m²
Temperature 21 °C – DC at press intake 20% – 6.3 MPa



Dryness (DC) vs. freeness
Recovered paper (SR 44) – FbM 1,500 g/m²
Temperature 21 °C – DC at press intake 20%

pressurized up to 10 MPa in the FiberXPress pressure chamber, thereby simulating mechanical dewatering in a press. The FiberXPress enables on-site visualization of dry content development as a function of time, and the effects of varying pressing duration, nip pressure and temperature can be analyzed precisely.

Better dewatering possible

Since this new development was focused above all on realistic simulation of press conditions, FiberXPress test results enable well-founded recommendations for press optimization. It may, for example, be a good idea to change the press configuration, use a different type of press roll, or increase line force in the nip. The effects of using a different furnish can also be simulated with the FiberXPress under laboratory conditions and evaluated. In any case, analysis with the FiberXPress always shows clearly how to improve press dewatering performance and save operating costs accordingly.

The required pressure is built up with compressed air in the upper chamber of the FiberXPress. Water pressed out of the stock drains into the weighing scale dish underneath. Stock dewatering performance is assessed by analyzing the dried fibers and the extracted water

Customer Comment

Ir. Drs. A.W.M.B. (Ton) van Haasteren
Technologist Paper and Board Thermodynamics Smurfit Kappa Paper Production Technology

Ir. L.P.M. (Loud) van Kessel
Senior Process Engineer
Smurfit Kappa Roermond Papier B.V.

"We found FiberXPress an extremely useful tool for showing up fiber dewatering performance. It is much more advanced than conventional test methods, based for example on water retention capacity or freeness. The test parameters are controlled more precisely and can be varied over a wider range. This enables a better approximation to the papermaking process, with more conclusive results accordingly".

Contact

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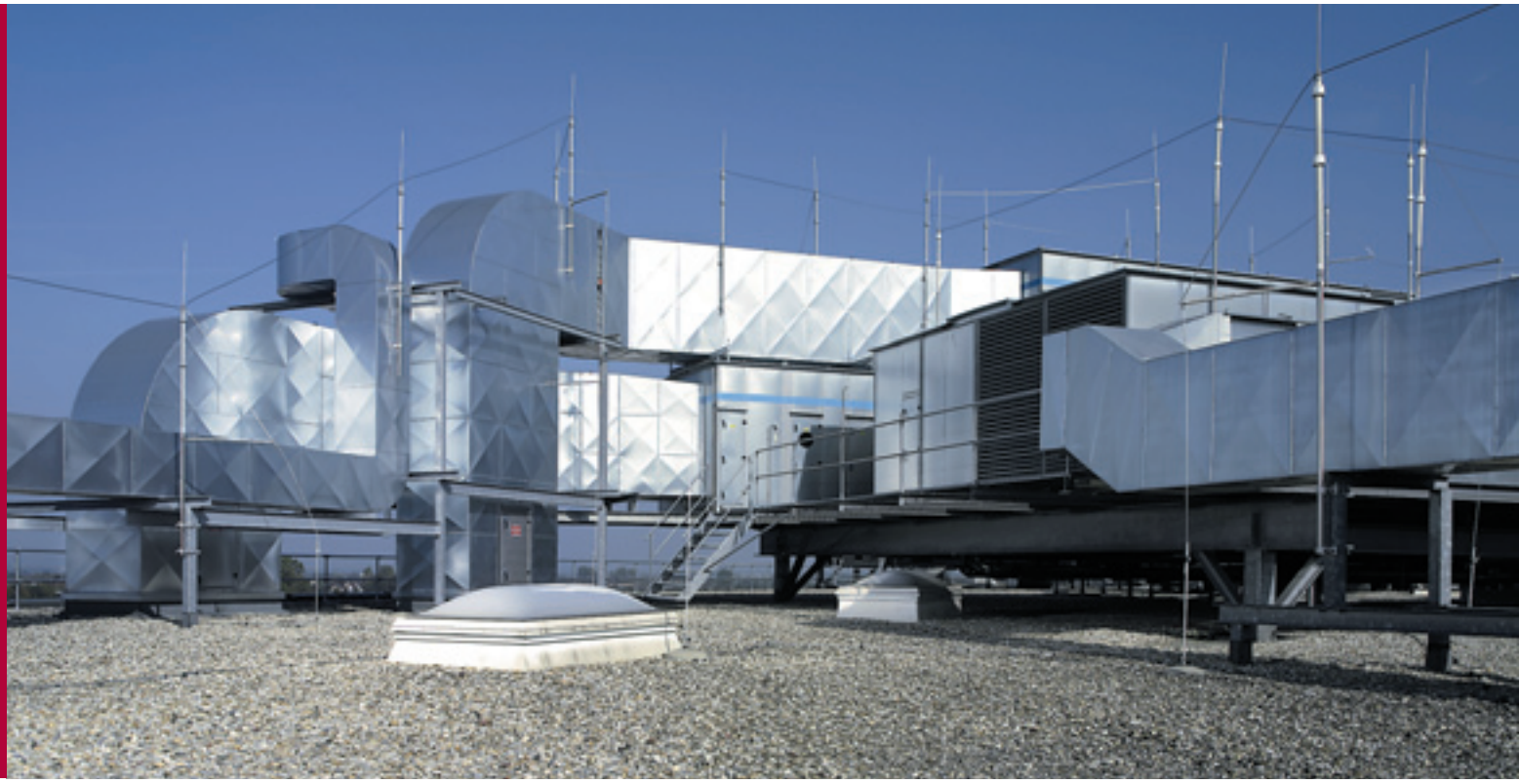

Air handling unit on the roof at Zott in Mertingen, Germany

Voith Paper Air Systems opens up new industries

Cooling and ventilation for cola, paper, and yogurt

What do dairy products, textiles, and beverages have to do with Voith Paper? Since the founding of Voith Paper Air Systems on 1 June of this year, quite a bit.

The new cooling and ventilation systems division, based in Bayreuth, Germany, works primarily with the paper industry, but even in the formation period, the potential for industries not previously addressed by Voith Paper became apparent. So in the future, the system provider for paper machines will deal not only with the optimization of dryer sections, but also the cooling and ventilation technology for yogurt and thread. This offers advantages for manufacturers and retail giants, as well as for individual consumers.

With the integration of essential components and all of the technology of the former Wiessner GmbH into the Voith Group, a comprehensive restructuring took place. This led to the creation of two product centers (Center of Product – COP): paper, foods, and a special division, which includes tobacco products and textiles. With over fifty percent of the sales volume, the paper division clearly dominates, but also in the other two areas there is still enormous potential, according to Dr. Hermann Bernard, head of Voith Paper Air

Systems during the start-up phase. "The current structure gives us many opportunities for development. This is shown by the initial orders, such as a cooling tunnel for Milchhof Brixen – BRIMI, the only mozzarella producer in South Tyrol, or the construction of a special blow box for cooling synthetic fibers for Oerlikon Neumag, the system provider for the textile industry."

Optimum process air is critical

With the acquisition of Wiessner GmbH, Voith Paper Air Systems has gained years of experience in ventilation technology, especially for paper production. In one current order for the Klingele Papierwerke, for example, the process air technology, including the steam and condensate system for the Voith Boost Dryer will be delivered to the Klingele plant in Weener, Germany.

Optimum process air is critical, especially in the dryer hood of a paper machine. There is not only extreme heat during the drying process of paper but chemicals are released into the environment, too. In order to achieve high paper quality, ventilation equipment from Voith Paper Air Systems is quickly and thoroughly removing the emitted materials, while simultaneously controlling the direction of the airstreams. The joints between the hoods are a particularly difficult area. Thermal bridges can occur here, forming so-called dew points. If the moisture inside the hood condenses quickly, drops may fall on the paper web. At production speeds of up to 2,000 meters per minute, this may result in costly breaks.

Saving costs with EOS

The dew points in the paper machine hoods made by Voith Paper Air Systems are higher than in those of the competitors. "This has a noticeable effect on the energy usage and lowers costs," explains Dr. Hermann Bernard. The higher the dew point is, the less energy is used. At the same time, the controlling system EOS (Energy Optimization System) realizes an optimum energy utilization by improving the efficiency of the heat recovery system. Even at the after-dryer section, the process air can be improved by an optimum ventilation system. Furthermore, Voith Paper Air Systems provides balanced climate control in buildings where paper machines are in operation. That prevents corrosion and mold.

Using paper expertise in other industries

Voith Paper Air Systems not only works in paper production, but also in the field of the food sector and special industries such as textiles, beverages or tobacco. Examples are a cooling system for bottling Coca-Cola and the ventilation in the production facility of a textile producer in Dubai. "Our goal is to transfer our extensive process experience in the paper industry to other industries. There is still great optimization potential in the production chains of foodstuffs, which have not been exploited. Particularly for dairy products, improved process technology between the milk production and the delivery of the finished product has a great potential. Here, the integration of individual process steps and an improvement in economy can be achieved," says Dr. Bernard.

Increased dew point in the dryer hood cuts energy costs

Double acting cooling tunnel (interior view)

Cooling tunnel (exterior view)

Voith Paper Air Systems is already involved in the cooling process for dairy products and its cooling technology offers clear advantages for producers and retailers. For some facilities, the cooling of the production temperature can last up to two days. In the cooling tunnel from Voith Paper Air Systems, complete pallets are cooled in one to two hours. This produces competitive advantages, because the shelf life is not only increased, but can also be more precisely defined. In addition, optimally cooled food-stuffs meet the strict ISO standards for the food industry. And last but not least, every consumer benefits from the defined shelf life of the products they buy.

Process experience can also be transferred to special areas. In textile plants, for example, the process air must be adjusted to the type of thread. “This is a balancing act. Depending on the ventilation, a thread can tear or become supple,” says Dr. Bernard. Another unusual area of use is in belt washers for the tobacco industry. Here, too, the ventilation and removal of moisture contribute significantly to the quality of the product. Various products and services round off the portfolio. This refers, for example, to maintenance as well as measurement tests, single components and spare parts.

Automatic belt washer

Voith Paper Air Systems

Since October 1, 2007 Voith Paper Krieger GmbH & Co. KG, Mönchengladbach and Voith Paper Air systems GmbH & Co. KG, Bayreuth form the Voith Paper Air Systems group within Voith Paper.

Voith Paper is now able to cover the entire range of air systems products: The know-how for paper machine hoods, air-conditioning, air ventilation and heat recovery systems is concentrated in Bayreuth. The specialists for non-contact-drying as well as non-contacting web guiding systems are located in Mönchengladbach. There are approximately 180 employees at Voith Paper Air Systems.

Contact

Rainer Pumpe
Voith Paper Air Systems
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Since October 1, 2007 Rainer Pumpe, Vice President Air Systems, is the responsible manager for both locations in Bayreuth and Mönchengladbach. He is the successor of Dr. Hermann Bernard, who headed the location in Bayreuth during the start-up phase.

Mochenwangen paper mill produces FSC certified paper on PM 3

Paper for over 10 million Harry Potter books

The Mochenwangen paper mill, Germany, produced more than 10,000 tons of paper on the PM 3 by Voith for the latest, seventh volume of the Harry Potter series. The English, German, Italian, Finnish and Norwegian editions were all printed on the high-quality, FSC certified paper.

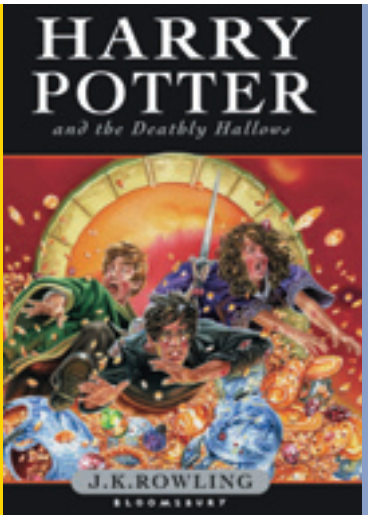
Mochenwangen paper mill is celebrating a huge success this year: the most sought-after book in the world at the moment was printed on paper by the Upper Swabian paper maker.

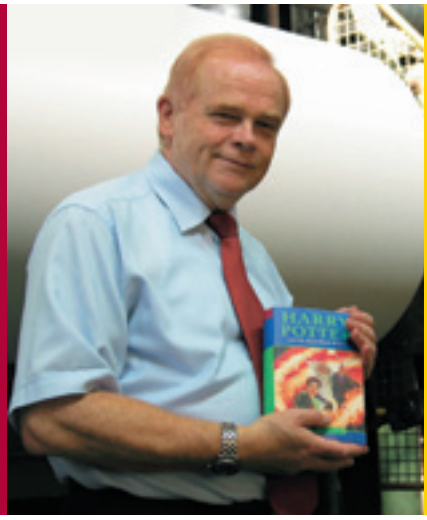
Without resorting to tricks or trickery, the PM 3 paper machine by Voith ran especially hot, producing at least 100 tons of paper every day over a four month period for the seventh edition of "Harry Potter".

Paper production for the English edition, which was launched on 21 July 2007, began in May and took until 10 July. During this period, three to five truckloads had to be transported every day to the printer in England, where the rolls of paper had to be delivered punctually in 30-minute time slots. The paper mill took from August to November to complete the paper production for the German, Italian, Finnish and Norwegian editions. "We produced paper for more than ten million Harry Potter books altogether", said Dr. Jürgen Helbig, Managing Director of the Mochenwangen paper mill. "That was a logistical challenge. After all, we still had other customer orders to fill." By moving production onto the two other Voith paper machines, all orders could be processed reliably.

The seventh volume about the likeable wizard is so far the most forest and environmentally friendly book of all time. Author Joanne K. Rowling took it upon herself to ensure this was the case. The FSC certified paper has a considerably high recycled paper content, which must be exclusively from post-consumer waste, i.e. paper that has actually been used. The FSC certification confirms that the wood for paper production comes from sustainable forest operations – a certificate that only a few paper mills can produce.

Voith's PM 3, which was built in 1956 and has already been upgraded several times, is currently being optimized further, also in cooperation with Voith. "The PM 3 is an absolutely stable machine, which produced reliably during the Harry Potter phase. We now want to develop it further to enable us to specialize increasingly in volume paper for books," explains Dr. Helbig. The PM 3 currently has an output of 35,000 tonnes per year but this will soon be 45,000 to 50,000 tonnes per annum.





Left: Harry Potter volume 7 in English and German version

Right: Dr. Jürgen Helbig, managing director of Papierfabrik Mochenwangen with volume 6.
Also "Harry Potter and the Half-Blood Prince" has already been successfully produced on PM 3

The dancing lion wishing Voith Paper China a bright and prosperous future. From left to right: Ming Ming Liu, President Voith Paper China Co., Ltd.; Dr. Hermut Kormann, President and CEO Voith AG; Dr. Hans-Peter Sollinger, President Voith Paper

Dr. Hermut Kormann, President and CEO Voith AG, giving his welcome speech at the opening ceremony

Building the Voith Paper City in Kunshan

Opening of new Technology and Service Center in China

Dr. Hermut Kormann, President and CEO Voith AG, awakens the sleeping lion, a traditional Chinese symbol for having a blessed and prosperous future

Some 70 years after Voith Paper delivered the first paper machine to China, the company and its customers reached another important milestone on October 26, 2007 in Kunshan, China. The grand opening of Voith Paper's new Technology and Service Center in China enables Voith to better serve its customers' needs in the rapidly growing Chinese and Asia/Pacific markets.

Over 150 valued customers from China and Asia/Pacific joined top-ranked government officials, Voith executive board members and local employees to celebrate the inauguration of the phase one buildings in the widely anticipated "Voith Paper City."

Located near metropolis Shanghai in the hi-tech industrial park of Kunshan, one of China's fastest-growing cities, the new facility is designed as the manufacturing epicenter for all Voith Paper operations in China, consisting of over 70,000 square meters of production and office space. The total investment accumulates to 50 million Euro.

By October 2008, Voith Paper will complete the second phase of construction on the "Paper City",

Ribbon cutting of Voith Paper's top customers and Voith management (from left to right): Jackson Huang, Representative of APP; Dr. Hans-Peter Sollinger, President of Voith Paper; Xuerong Zhou, Deputy Mayor of Kunshan City and Director of the Kunshan New and Hi-Tech Industrial Development Zone; Dr. Hermut Kormann, President and CEO of Voith AG; Fengquan Zhu, Standing Member of the Communist Party of China – Kunshan Committee; Yin Zhang, President of Nine Dragons Paper Group; Jianhua Li, President of Huatai Paper Group

allowing for Voith Paper Fabrics and Voith Paper Rolls to move from their current location in Kunshan to the new site. Voith Paper Fabrics has employed local citizens at its paper machine clothing plant for the last decade. In 2003, Voith Paper Rolls arrived at the Fabrics location and established a separate service center for roll covers.

Through hosting all of its seven divisions under one roof, Voith Paper is creating a veritable hub of papermaking knowledge and available expertise for its domestic and international customers. Providing a comprehensive portfolio of system solutions, products and services in a more focused and efficient way is critical to meeting today's growing customer demands. This consolidated, vertically integrated model enables Voith Paper to sharpen its profile as the only full process supplier and technology leader for the paper industry in China and across the globe.

"We are proud to celebrate the opening of this new Technology and Service Center, which we built to better meet our customers' needs in a region that continues to see tremendous growth for our business," said Dr. Hans-Peter Sollinger, President of Voith Paper. "Voith is strategically positioned at the forefront of China's transformation into a global papermaking giant. This enhanced presence is a testimony of our commitment to support Chinese papermakers in taking the lead in the global paper business."

Prominent customers from the paper industry like the richest woman in China, the President of Nine Dragons Paper Group, Yin Zhang, the President of Huatai Paper Group, Jianhua Li, and Jackson Huang as representative of APP helped Voith Paper usher in its historic new era in China by participating in the ribbon-cutting ceremony. The distinguished dais noted that China currently has the most advanced and efficient paper machines in the world, and that this would not have been possible without such a trusted and reliable partner as Voith. A big kudos at the end of a very successful opening ceremony.

Contact

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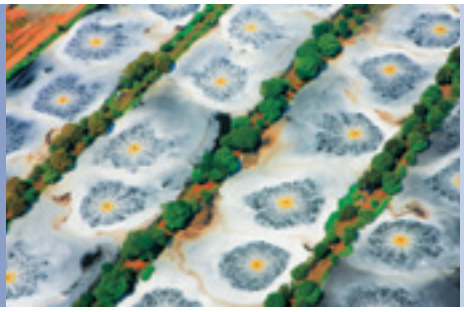


Left: Book restoration. Right: Water treatment in Brazil – more in "The Role of Paper"

New paper book of interest to both laypeople and experts

The Role of Paper

"The finest paper that I can remember since my youth was the paper from ...," writes Martin Mosebach in one of eight short stories about paper. Martin Mosebach was recently awarded the most prestigious German literature prize, The Georg-Büchner Prize. You can learn what paper so fascinated Mosebach in "The Role of Paper". The book will appear in December 2007 in German and English from the Deutsche Verlags-Anstalt and will be available in bookstores. The editor of the second book on Voith's markets is once again Georg Küffner, member of the technology and motor editorial department of the Frankfurter Allgemeine Zeitung. In 2006, Georg Küffner edited the first book in the Voith series, "The Power of Water" on the energy market. "The Role of Paper" is not just for experts, but will also give "paper laypeople" with a clear and, above all, entertaining overview of all aspects of this fascinating material. Twelve conversations with people from the world of paper, such as a Scandinavian logger, a restorer of old books, and an environmental activist provide readers with interesting insights. And don't forget, you will also learn more about Martin Mosebach's favorite paper.

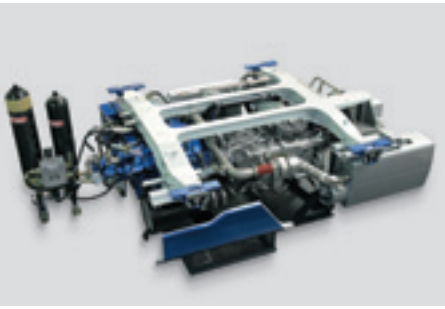
Available in bookstores as of December 2007

Customer magazine under new leadership

Change of staff in the twogether editorial office

In October 2007, Dr. Wolfgang Möhle, who had been head of Corporate Marketing at Voith Paper for 10 years, went into well-earned retirement. After 24 issues, he has handed the scepter on to Stefanie Weber. When the idea for the twogether magazine first arose, Dr. Möhle enthusiastically worked for its realization and took on the role of editor-in-chief with the first edition, which appeared in December 1995. In his twelve years, with the appearance of 24 twogether editions and several special editions, the regular readership grew by a factor of four, so that today twogether appears in five languages with a total run of over 35,000 copies per edition.

Stefanie Weber, who has already been involved in Corporate Marketing at Voith Paper for more than five years, has taken on the responsibility for the established twogether magazine with this edition. We wish both of them success and fulfillment in the future – Dr. Möhle in retirement and Stefanie Weber in her new and interesting job.



Support for eight European General Motors assembly plants

Major contract goes to Voith Industrial Services

Voith Industrial Services has won a major contract from General Motors Europe (GM) to provide services for eight European assembly plants in Germany, Great Britain, Sweden, Poland and Spain for the next three years. It is the largest order ever for Voith Industrial Services in the automotive industry.

This is the first time that GM has awarded a standardized service package across different plants and countries. The contract is a pioneering move in the European automotive industry. The benefits for General Motors include greater transparency and optimization of costs and services. The contract covers technical cleaning, janitorial cleaning and services for external facilities.

To accomplish this, colleagues from Voith, DIW and Premier are working closely together. GM always has the same contract partner for a multitude of services. These are carried out in all locations to the same quality standards.

EcoPack – an innovation package for rail vehicles

Drive in and out of the station emission-free

Saving resources, minimising emissions and reducing noise are three very specific areas where Voith Turbo has a clear positioning as an innovative system supplier. The EcoPack applies seven separate innovations to demonstrate the technical opportunities offered by hydrodynamic drive technology. It makes the complete drive systems for rail vehicles even more economical and even more ecological. At the same time the EcoPack means that Voith already meets future standards for emissions and consumption in the railway industry.

The seven innovations are hydrostatic recuperation, the Voith SilentVent, an adaptive suspension, SteamDrive, a diesel particle filter with regeneration burner and integrated vaporiser, optimised sound proofing skirts and the new electronic control unit VTDCeco. This mix of new developed components brings enormous advantages to the future operator of a vehicle.

Voith Siemens Hydro Shanghai wins largest-ever order from China

Order value EUR 120 million

Voith Siemens Hydro Power Generation in Shanghai has won a contract for the delivery of the electro-mechanical equipment for Jinping II hydro power station on the Yalong River in the Chinese province of Sichuan. The order is worth approximately EUR 120 million, making it the largest-ever deal for Voith Siemens Hydro Shanghai since the company's establishment in 1994. The order was placed by Ertan Hydropower Development Co. (EHDC).

The contract marks the kick-off of a major hydro power development along the Yalong River, China's fourth-largest source for this type of energy generation. Located at the lower reaches of the river, Jinping II has a total capacity of 4,800 MW and is therefore the largest of the five hydro power stations on the Yalong. It will be equipped with eight Francis turbines, each rated at 600 MW. The power station has a maximum head of 318 meters and, running along 17 kilometers, its penstock is one of the longest in the world.