

twogether

Paper Technology Journal

**Integrated EcoMill relies on complete process integration | Hainan:
largest paper machine in the world | First Curtain Coater for board**



News magazine for the international clientele, partners and friends of Voith Paper.

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Dr. Hans-Peter Sollinger, Member of the Voith GmbH Management Board and President Voith Paper.

Dear customers, dear readers,

*“Raw materials are limited – but ideas are not.” Voith Paper has taken this idea as its guiding principle. In this edition of *twogether* you can read once more about our approaches to following this principle. But first, the most important matter: the best ideas are worthless if they can’t be implemented in practice.*

For that reason, let’s be specific: Starting on page 6, the lead article in this edition outlines Voith Paper’s concept of the Integrated EcoMill (IEM). The IEM is both ecologically and economically attractive and thus supports our customers in remaining competitive into the future. Adapted to the respective location, the customized IEM concept can be used worldwide. The Urban Mill variant, which is presented to you in the interview starting on page 13, is specifically suited to industrial urban areas. Up to 20% of operating costs can be saved with an Urban Mill.

The compatibility of ecology and economy is what we are concerned with – as expressed in the guiding principle cited above. Examples are the customer-made waste water treatment facility in the Swiss village of Perlen (p. 31) and the MultiForm IC forming fabric, which saves raw materials and energy (p. 42).

New components or new machines from Voith Paper impress not just with their superior level of productivity but also with their cost efficiency – especially in dealing with raw materials. The world’s largest paper machine Hainan PM 2, a symbol of the most modern paper manufacturing and almost 600 meters long, is synonymous with this (p. 16), as is the PM 1 in Nantong (p. 20). The latter is also an emblem of genuine globalization, because this is the first time the largest Japanese paper group, Oji Paper, has invested in a paper mill located in China.

That paper is not just a cultural asset but in equal measure a medium of the future was made clear in a panel discussion of professionals that was initiated by Voith Paper (p. 68). Representatives from a publishing company, a well-known library, Wikimedia and Greenpeace agreed: “Paper is a medium with a future.” I’m happy to share that view.

Enjoy your reading!



On behalf of the Voith Paper Team



On the cover picture

The global resources of fibers, energy and water are limited and thus becoming ever more expensive. Voith's Integrated EcoMill confronts this scarcity and is attractive due to a concept that protects the environment and lowers costs.

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First Curtain Coater in board production.

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Tissue producers increasingly opting for Voith Paper.

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Economical, environmentally friendly, regionally adapted:

The IEM relies on complete process integration

The Integrated EcoMill (IEM) from Voith Paper scores twice: fewer resources are consumed and at the same time investment and operating costs are lowered. This is facilitated by highly integrated sub-processes – both inside and outside the paper mill. The consumption of raw materials, energy and water is thus optimized, which yields tangible economic advantages. The IEM is both ecologically and economically attractive and is a sustainable alternative to conventional paper mills.

With its concept of the completely integrated paper mill, Voith Paper is confronting the lack and increase in prices of resources and the rising cost pressure in paper production. “We can clearly reduce consumption of resources in paper production and support our customers in operating sustainably, while at the same time lowering their manufacturing costs,” explains Markus Oechsle, responsible for Order Processing at Voith Paper. Oechsle continues: “A big advantage of the IEM is how it can comprehensively take into account the various location factors and framework conditions to which we need to individually coordinate the mill concept.”

Integrated processes are more cost-efficient

Already in the planning of an IEM, the fiber, energy and water cycles and

specific location factors are taken into account and integrated into the overall concept. The resulting customer-made solutions not only improve resource consumption, but they also significantly minimize the investment costs and ongoing operating costs of an IEM.

The integration of all relevant sub-processes, whether they are inside or outside the production line, makes the IEM economically and ecologically attractive. Markus Oechsle continues: “We coordinate the sub-processes perfectly with one another so that our customers profit from considerable cost savings. This is achieved by designing the components used in an optimal way, which results in a lower resource consumption.” The paper producer therefore profits from the more efficient use of energy, water and fiber. The IEM concept can be smartly implemented both in new plants and

in rebuilds. Markus Oechsle emphasizes: “With the IEM, we succeeded in uniting various specialized disciplines and gathering them together in an integrated solution-oriented approach. This especially demonstrates the expertise of Voith Paper.”

Coordinated with the customer and the location

Today, high efficiency is essential for success if a paper mill is to prevail in competition. For that reason, within the framework of a feasibility study, Voith Paper develops the ideal solution for the customer’s existing conditions.

First, it is a matter of selecting the suitable reference model from the ready-made IEM reference portfolio, which is then individually adapted to the location and the customer’s needs. Various questions have to

“We can clearly reduce consumption of resources in paper production and support our customers in operating sustainably, while at the same time lowering their manufacturing costs.”

Markus Oechsle



With integrated water, fiber and energy cycles, the IEM consumes less resources than conventional mills.

be answered in the process: Is the new paper mill to be built in the greenfield or in an industrial urban area? Which raw material would make sense? Can, for example, the surrounding industry be integrated? What production quantities should the paper mill achieve? These and many other questions are answered in a structured way, and the results are incorporated in the customized IEM concept.

All parameters are individually evaluated and contribute to the overall assessment for the mill. Thus, the requirements for electricity, steam, water and chemicals are first calculated. In the next step, the interrelation of all relevant sub-processes is determined. This includes modeling the mill for various stock compositions and production quantities and representing the various operating states for individual sub-processes (startup, shutdown, grade change, etc.). Finally, all system components are put together in an efficient optimum.

The last step consists of drawing up a comprehensive economic efficiency calculation of the investment and operating costs for the customized IEM. Therefore, the financial risk for the customer is minimized. Such a business consideration shows that economic advantages can come with sustainable ecological paper production. The integrated solutions provide for quick amortization of the investment in the IEM.

Using fibers efficiently and sensibly

Depending on the location, use of virgin or recycled fibers is preferred as a raw material. The idea of the IEM is based on the fact that the existing location advantages are utilized in such a way that they are included in the overall concept in an economically and ecologically sensible way. At the Três Lagoas paper mill in Brazil, for example, the proximity of the production location to a pulp mill and to the existing eucalyptus plantations was thus utilized. A conscious decision



Location factors such as proximity to a eucalyptus plantation are taken into account in the planning of an IEM.

was made to use eucalyptus pulp. The transport costs for the raw material are minimal. Due to the nearby pulp mill supplying the paper machine with steam and power, it was not necessary to invest in a power plant. In addition, the waste water of the paper mill is disposed of in the pulp mill so that a separate clarification facility was not necessary.

In order to be able to serve the rising global need for paper, however, the portion of recycled fibers in paper production must be noticeably increased. This is the only way that the valuable wood resources can be sustainably managed for responsible production. The use of recovered paper makes sense, especially in proximity to industrial urban areas, since that is where the paper consumers and the recovered paper suppliers are. Short approach routes minimize the required transport costs and the delivery time





Today, a variety of paper grades can be produced from recycled fibers. The use of recovered paper in paper production is smart, especially near industrial urban areas.

considerably. In addition, using recycled fibers reduces the energy consumed during paper production.

Due to the enormous technological developments of the last few decades, the possibilities for using recovered paper fibers have steadily increased. While some grades, such as newsprint papers, are already produced by using up to 100% recycled fibers, there is a change even at high-quality graphic papers.

Since 2004, the example of LEIPA Georg Leinfelder in Schwedt, Germany, has shown that a ratio of up to 100% recovered paper is possible in the production of first-class LWC paper. On the PM 4 from Voith, 360,000 tons of LWC paper per year are produced with recycled fibers as the raw material. In Schwedt, Voith Paper succeeded for the first time in producing coated magazine paper grades with such a high proportion of recovered paper –

all the while maintaining the quality level demanded.

Energy from residual materials and sludge

An IEM that is operated with a high portion of recycled fibers has a higher amount of residual material. A system for processing these materials is an economically sensible possibility here, to lower the disposal costs that tend to increase. The residual materials are thermally utilized in the process, which additionally lowers the energy costs.

With the IEM, accumulating paper sludge and rejects are used to generate steam and electrical energy. This is achieved with the application of a fluidized bed boiler for solid fuels. Only a reduced amount of ash remains. These systems thus pay off within a few years because disposal and transport costs are saved. In addition, the paper mill becomes

independent of external disposal companies.

Through an economic evaluation, the energy requirements of the IEM are adapted to the respective local conditions. In doing so, a comprehensive waste and energy concept is drawn up. Therefore, for example, integration of a biomass power plant into a paper mill increases the latter's efficiency.

The minimized energy requirement of an IEM is an enormous competitive advantage if you consider that energy costs account for about 18-20% of the total costs of paper production. The optimal use of energy is an important adjusting lever for ensuring efficient paper production in the future as well.

As little fresh water as possible

The water cycles are integrated throughout the paper production

process, minimizing fresh water consumption. The individual consumers are optimized, waste water is treated and the purified water is used in as many places as possible. The treated waste water can be used for cooling drives or as shower water, for example.

Not only does less fresh water consumption mean lower costs, but also in many countries there is water scarcity, so that fresh water is a rarity. Thus reduction of fresh water consumption is a real issue for paper producers in these regions. Through intelligent use of various water qualities, Voith Paper is succeeding in noticeably reducing the need for fresh water.

IEM confronts global resource scarcity

The resources required for paper production are becoming ever more limited and thus more expensive worldwide. In particular, the availability of wood as the source for virgin fibers is limited in the medium term. Fresh water and fossil fuels are also coming up against availability limits in many regions of the world.

On the other hand, looking at various independent studies, Voith Paper assumes that the need for paper – which today is about 400 million tons – will rise by 200 to 300 million tons worldwide in the next 30 years. Only efficient resource-saving paper production will be able to meet this future need.

Example: “Integro” paper mill

In order to be able to specifically identify some of the economical and ecological advantages of an Integrated EcoMill, a practical example is used.

Machine data:

Paper grade: writing/printing paper

Raw material: recycled fiber

Annual production: 220,000 tons

Initial conditions

A paper mill, hereinafter called “Integro”, is designed to be constructed as an IEM in the greenfield. A biomass power plant that is integrated in the paper production process is planned for power and steam generation. The total capacity of the power plant is estimated at 32 MW of biomass power. About 15 MW of this is for the mill’s own purposes, while the remaining

17 MW can be fed into the power network as biomass power.

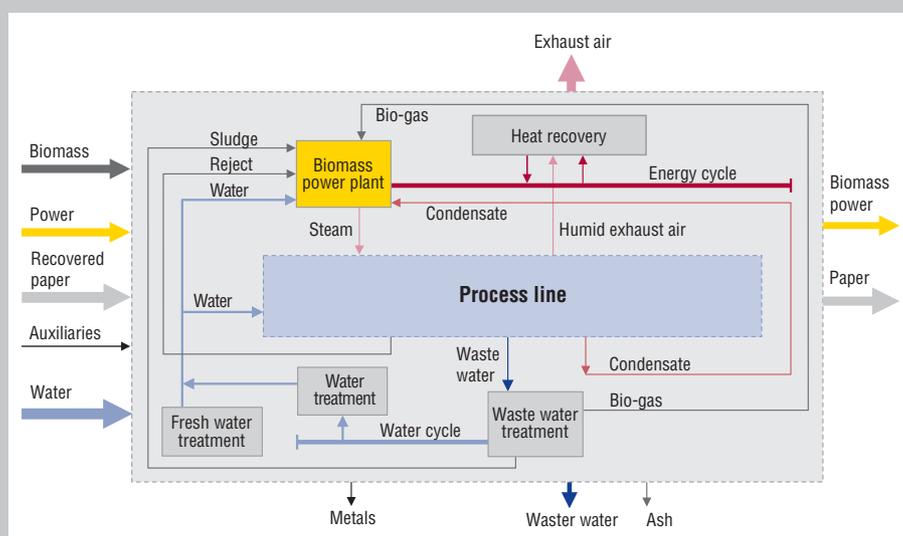
Fresh water consumption should be reduced to a minimum through systems for water treatment and the integration of water cycles.

Residual materials can be burned in the power plant for energy production, which at the same time lowers the disposal costs.

Feasibility study ensures economic advantages

In the first step, various system concepts are investigated and evaluated. The results at Integro show that the total investment costs including a biomass power plant amount to around 200 million euros.

“Integro” concept: Integrated EcoMill with biomass power plant and water treatment.



Exemplary use of energy

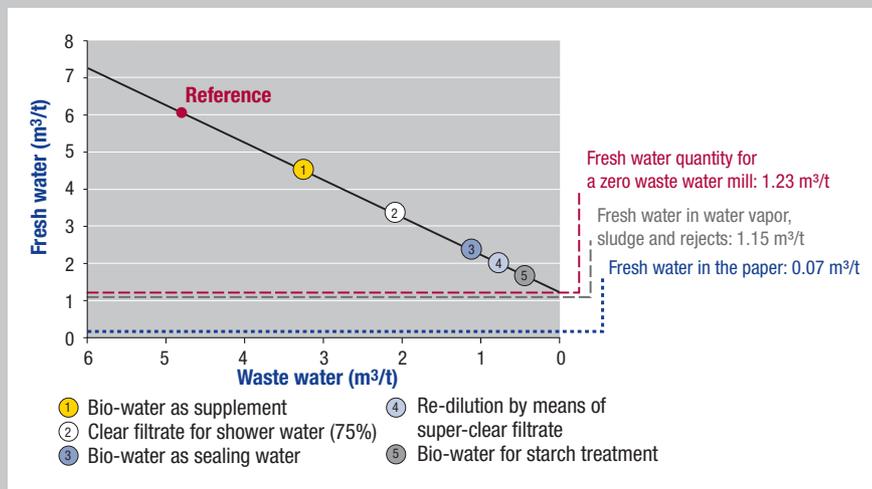
Thanks to the integration of a biomass power plant in the production line, a considerable portion of primary energy is saved. The steam generated in the power plant is fed to the paper machine – after the power generation turbine. The PM thus becomes the condenser for the power plant. The integration of power plant and paper machine enables the ideal combined heat and power generation. The energy is used in the power plant for power generation and the heat of the hot steam is used in the dryer section for drying the paper web. At the Integro example, this led to savings amounting to 20% of primary energy.

water can be lowered to a minimum. At various points, fresh water can be replaced by clear filtrate, super-clear filtrate or bio-water, i.e., treated waste water. Therefore, a gradual economization is achieved, depending on the extent of integration of individual sub-processes that are consistently implemented. At Integro, consumption of fresh water can thus be reduced from 6 m³/t of paper to below 2 m³/t of paper.

Need for fresh water is reduced

With the intelligent use of different water qualities along the paper production process and closed cycles, consumption of fresh

By using different water qualities, fresh water consumption can be gradually reduced to below 2 m³/t of paper.



In conversation: Markus Oechsle on the Urban Mill

“Especially good for urban areas”

A special variant of the IEM is Voith Paper’s Urban Mill – an integrated paper mill in the vicinity of an industrial urban area. Along with low consumption of resources, papermakers additionally benefit from low investment, operating and logistics costs. Markus Oechsle explains what is behind the Urban Mill concept.

twogether: What is meant by the term urban mill?

Markus Oechsle: In general, urban mills are paper mills that are built near their consumers. The respective region is thus supplied with board and packaging paper, printing and writing paper, specialty grades or tissue.

For some years now, we’ve seen a trend emerging in the paper industry: more and more paper producers are building their mills near industrial centers. Due to the increasing use of recovered paper, proximity to the raw material and the consumer and shorter transportation distances are of increasing importance to them.

twogether: And what is special about Voith Paper’s Urban Mill concept?

Markus Oechsle: What is new is the fact that these mills are essentially integrated twice: First of all, integration into the industrial surroundings, and second, integration of all relevant sub-processes within the paper mill. We are pursuing a ‘closed-loop’ approach, that is, the fiber, energy and water cycles are nearly closed. This immediately has several benefits: investment, operating and logistics costs are significantly reduced. In addition, less energy and water are consumed. And hardly any residual material is left that has to be disposed of.

twogether: What does that look like practically?

Markus Oechsle: Take the fiber cycle as an example. In the Urban Mill, recovered paper collected in the urban center is prepared and processed into new paper. If additional virgin fibers are required, they can be purchased from the market. The use of fibers from recycled paper also lowers the consumption of primary energy because virgin fibers are much more energy intensive to prepare.

In the energy cycle, the heat generated within the papermaking process can be reused. In addition, the transformation of waste materials into steam and electrical energy noticeably reduces costs. Also, potential recyclables are sorted out in a smart way and reused. That lowers the disposal costs.

We also aim for closed water cycles to minimize water consumption. Cooling cycles are closed and

purified waste water is fed back into the papermaking process. In this way, fresh water consumption and the accumulating waste water can be reduced to a minimum.

What is also important here is that the Urban Mill is not viewed in isolation; the industrial surroundings are also considered. Waste material and waste water from outside the paper mill can thus be reused in the Urban Mill.

In short, all processes in the Urban Mill are optimally adjusted with one another and to the existing regional conditions.

twogether: Lower resource consumption means lower operating costs. Is there any additional saving potential?

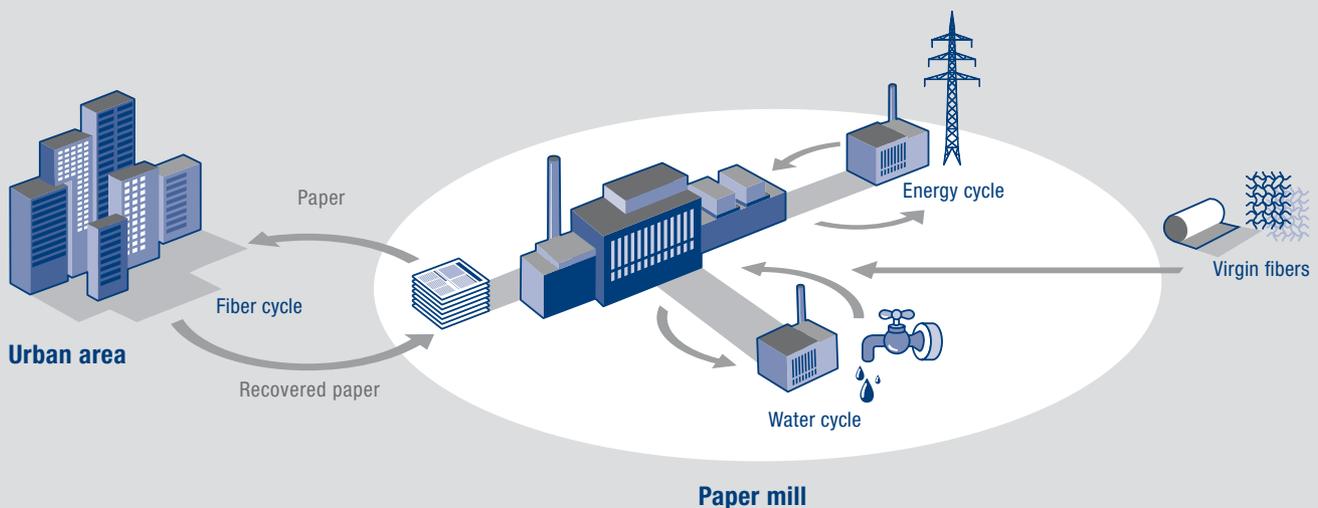
Markus Oechsle: Yes, by all means, adaptation of the of the

production capacity to the conditions on site and the optimal design of the processes and system components both lead to lower investment costs. Delivery from one hand decisively contributes to this. The specific costs for both small and large production facilities are quite similar.

In comparison with conventional paper mills, a higher cash flow is generated and a quicker return on investment is achieved. Investment in an Urban Mill is highly attractive, not just from an ecological perspective but also from an economic point of view.

Since in the case of an Urban Mill the paper is consumed in the surrounding urban center, this lowers the ever-increasing transport costs. Of course, the same applies for the procurement of recovered paper.

“Investment in an Urban Mill is highly attractive, not just from an ecological perspective but also from an economic point of view.” Markus Oechsle



Recovered paper is becoming more and more important in papermaking. Already today it makes up more than 50% of the raw material for paper production. We assume that in a few years worldwide paper production will use more than 70% recovered paper. Since a lot of recovered paper accumulates in an urban area, it can be gathered at the front door of the Urban Mill, so to speak. Proximity to the end consumer of the paper, who is at the same time the raw material supplier, pays off here.

Low transport costs: the Urban Mill is close to the population, which is at the same time paper consumer and supplier of recovered paper.



twogether: How do you proceed with a new Urban Mill project?

Markus Oechsle: Initially, we have prepared neutral reference concepts for the most important paper grades. Together with the customer, the respective concept is then adapted to the local conditions within the framework of a feasibility study. In other words, a detailed situation analysis precedes every project. We make sure that all sub-processes of papermaking are optimally coordinated

with one another. In addition, the cost effectiveness and efficiency of the paper mill can be increased by integrating alternative industries in the surroundings of the paper mill. For example, municipal water clarification facilities, power plants and garbage sorting facilities are interesting in this connection.

twogether: Are there countries or regions that are especially suitable for the Urban Mill concept?

Markus Oechsle: As already mentioned, it is especially suitable for industrial centers with high population density and existing infrastructure. This especially applies to growth markets such as India and China, for example. The required infrastructure is frequently lacking in the rural areas, but it is already present in the catchment areas of urban centers – the ideal surroundings for an Urban Mill.





Exceptional project jointly completed

Hainan PM 2 – the largest paper machine in the world

In May 2010, Hainan PM 2, with a wire width of 11.8 m and a length of almost 600 m, started up successfully. The huge paper machine hall called for maximum fitness on the part of the erectors and startup personnel. Furthermore, the Hainan climate, with high humidity and temperatures sometimes exceeding 40°C, presented a great challenge for man and machine.

It all began with a letter of intent for three large paper machines, signed by Teguh Ganda Wijaya, CEO of Asia Pulp and Paper (APP). Among Guangxi BM 1 and Hainan PM 1, APP planned Hainan PM 2 – the largest paper machine in the world. On July 6, 2007, the work for the paper machine, which should exceed all present dimensions, was started with the engineering order.

APP places great importance on the reduction of fresh water and the minimal use of virgin fibers in its

papermaking process. The latter is achieved through an increase in the coat application by means of pigments (mainly ground limestone). APP's member of the board, Jensen Ko, commented to the media just a few months ago that of foremost importance to his Group is combining state-of-the-art papermaking with resource conservation. The new PM 2 from Voith Paper will live up to this claim. The fresh water consumption in the overall plant per kilogram of paper produced is around 5 liters, well below the maximum consumption of

10.5 liters stipulated by the Chinese government. Comparable fine paper machines in Europe require, on average, about 8 liters per kilogram of paper produced. Due to the reduced use of fresh water, the quantity of effluent is also reduced. The mill's own water preparation system at APP in Hainan has a capacity of 100,000 m³ per day.

Enormous logistic challenge

An exceptional project like Hainan PM 2 requires good preparation, from



JHPP

Hainan Jinhai Pulp & Paper Co., Ltd. (JHPP) – a subsidiary of APP – is the largest pulp manufacturer in China and among the largest in the world. Since November 1994, JHPP has been producing on an area of 4 km² and employs 1,600 workers. Production covers not only pulp and tissue, but also art paper and brochure paper of the highest level, as well as high-quality packaging, folding boxes and calendars up to a basis weight of 250 g/m².

Technical specifications

Stock preparation

| | |
|-------|-------------|
| DIP | 355 t/day |
| NBKP | 710 t/day |
| LBKP | 1,655 t/day |
| BCTMP | 1,185 t/day |
| PCC | 700 t/day |

Paper machine

| | |
|--------------------------|------------------------|
| Uncoated paper weight: | 151.1 g/m ² |
| Finished paper weight: | 255.3 g/m ² |
| Wire width: | 11,800 mm |
| Maximum operating speed: | 1,700 m/min |
| Design speed: | 2,000 m/min |
| Speed of Janus: | 1,500 m/min |
| Speed of VariPlus: | 2,500 m/min |
| Parent roll diameter: | 3,500 mm |
| Maximum production: | 4,537 t/day |

the beginning. In a two-day seminar, all of the participants met and learned their roles and the purchase order. In addition, rules for joint cooperation were developed. Afterwards the work started at Voith Paper: Layouts were developed, and components with long delivery times had already been ordered. At this machine width, modifications had to be carried out even in the Voith workshops in order to handle the wire width of 11.8 m and the corresponding weights. For the 87 dryers in the paper machine, new pouring holes

were specially made. For the production and erection of the 10 Voith LSC measuring frames – each one more than 14 m long – an additional extra-large hall was rented. Another difficulty was sourcing steel, as it had become scarce in the world marketplace, and capacities had to be reserved early.

Thanks to diverse preparatory work for the other two machines, Guangxi BM 1 and Hainan PM 1, both parties were clear about the demands made on the new machine, and the layouts

were able to be finalized quickly. As APP and Voith Paper have already cooperated successfully and with confidence on other projects, only a few visits to the workshop for approvals were necessary for the implementation.

Due to the enormous size of the machine, logistics also presented a major challenge. Since it is not always easy to transport long machine parts to the seaport, all possible transport routes were investigated in detail. The press



DynaCoat on-line coating aggregates.



One contact for all automation related questions.



Wet end with DuoFormer TQv and Tandem NipcoFlex press.

section alone, with a weight of approximately 500 t, required several low bed trailers and special night transport, as well as police escort, to reach the ship. In 18 partial shipments, approximately 1,500 containers plus 888 large transport units with a total weight of 30,000 t were taken to China. JHPP has its own port facilities in which the shipments of large machinery could be received, whereas the containers were unloaded in the next village, Yangpu, a few minutes away. The construction work and installation of the machine were organized by the customer itself.

“Paper on reel” 11 months after project interruption

Because of the recession in China after the Olympic Games and the global financial crisis, the project had to be interrupted for one year. Therefore, it was necessary to properly register, preserve and store the shipments. A great deal of discipline was called for on the part

of all participants in the processing in order to pack the parts in a strategically favorable way.

After the interruption the installation work began. In just 11 months of installation supervision, sometimes under the most arduous conditions, the goal of “paper at reel” was achieved on May 18, 2010. Since that time, the machine has achieved a maximum speed of 1,415 m/min, with an average of 1,350 m/min. The threading record to-date from the press to the Sirius reel is only 18 minutes – at a machine length of almost 600 m.

Huang Yifeng, project manager and Vice President of JHPP, is very satisfied and confident: “We are pleased to be able to work together with Voith Paper again on this project, the world's largest paper machine. Voith Paper's machine concept ensures the planned production capacity of Hainan PM 2. Right from the beginning, the machine capacity met our

expectations, and we assume the design values of the machine will be reached very soon.”

Location

China

Hainan

Hainan Island is located in the South China Sea separated from the Chinese mainland by the Qiongzhou Strait. The capital in the north of Hainan is Haikou, which can also be reached by air. The paper mill is located about two hours from the airport in an industrial development zone on the north coast of the island.

Contact

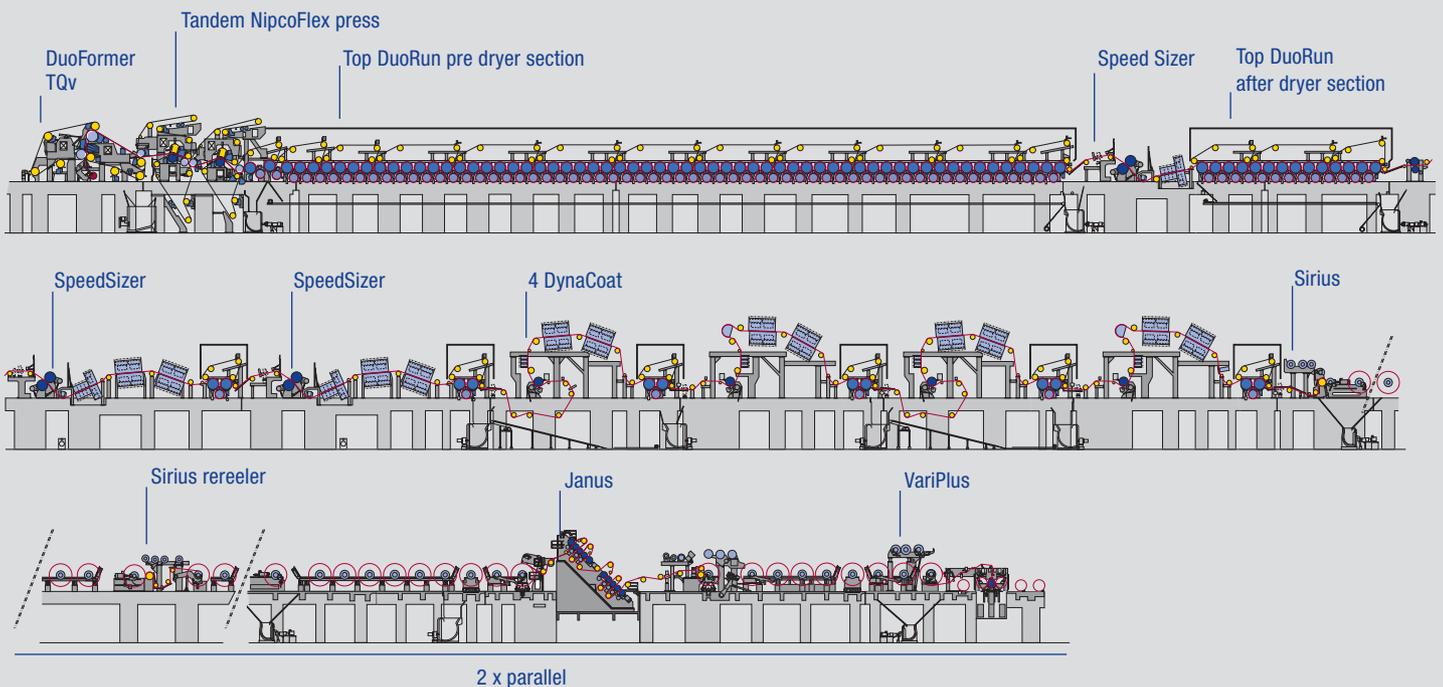
Johannes Rimpf
johannes.rimpf@voith.com



Parentroll transport to the Janus calender.

Perfect drying capacity due to contactless infrared drying.

Scope of supply Hainan PM 2



Stock preparation system with a total capacity of 3,750 t/day to prepare long fibers, short fibers and BCTMP. Energy efficient and gentle refining for optimal fiber development by utilization of the latest PLURALIS refiner fillings in the TwinFlo refiners.

All roll covers for the production line as well as 50% of the startup clothing and all doctor blades were supplied by Voith Paper. Additionally there is a "Total Roll Management" (TRM) contract for Hainan PM 2 (more about TRM on page 61).

Continuous automation package with some 20,000 I/Os for MCS and DCS, 10 measuring frames with 54 sensors and a monitoring system with 1,400 single measuring points a. s. o.

Complete system solution for contactless drying consisting of three gas-heated IntegratedDryer infrared dryers, four gas-heated InfraAir heating units, 12 MCB-Dryer air dryers and two CB-Turn airturns.



The largest Japanese paper group invests in China

Successful startup of Nantong PM 1

In the summer of 2008 Jiangsu Oji Paper placed an order with Voith Paper to supply a complete production line for high-grade woodfree coated and uncoated papers. In its 130-year history, this is the biggest investment the Oji Paper Group has made in China so far. Just two years later, in May of 2010, the so-called “China Stars” was successfully started.

The Nantong PM 1 was awarded to Voith Paper in a total package as a Process Line Package (PLP). This is especially remarkable since Japanese paper manufacturers frequently purchase the individual components of their paper machines from different suppliers. However, the PLP concept offers Oji the advantage of saving resources in its own project team: Voith Paper takes over coordination of all sub-suppliers. “Nantong PM 1 is Oji Paper's first new paper mill in China,” explains Muraji Nishi, project manager of the production line.

“To reduce the number of suppliers and thus the interfaces, we decided to award the contract for the supply of the complete Process Line Package (PLP) to Voith. This enabled us to handle the entire greenfield installation with very few people.”

Installation and startup were also simplified by the total package approach. Ultimately, only Oji Paper, its erection contractor and Voith Paper were involved. By means of these few interfaces, changes in the schedule or what is included in the

delivery were coordinated more simply and quickly.

Less energy and fresh water, fewer costs

In addition, the Process Line Package offers Oji Paper the advantage that the strength of Voith Paper as process provider fully takes effect. Thus in the case of “China Stars” a concept was developed that is designed for reduced energy consumption and less use of fresh water. Pumps with frequency converters are an

example of this. Surely they involve a somewhat higher initial investment, but already after a short time of operation, they pay for themselves through lower energy consumption.

The machine concept was developed in close collaboration and tailored to the requirements of Oji Paper. From stock preparation to the winders, the technical specifications were worked out in many joint discussions and subsequently confirmed by tests at the Voith Paper Technology Center (PTC) in Heidenheim, Germany.

Until the decision in favor of the Nantong PM 1, Oji Paper was

represented on the Chinese market by only one sales office in Shanghai. But the corporate group had already been intensively occupied for several years with construction of a paper mill in China so as to expand its presence in this market and to utilize the market potential even more. Fewer transport and personnel costs made on-site production economically interesting for Oji Paper.

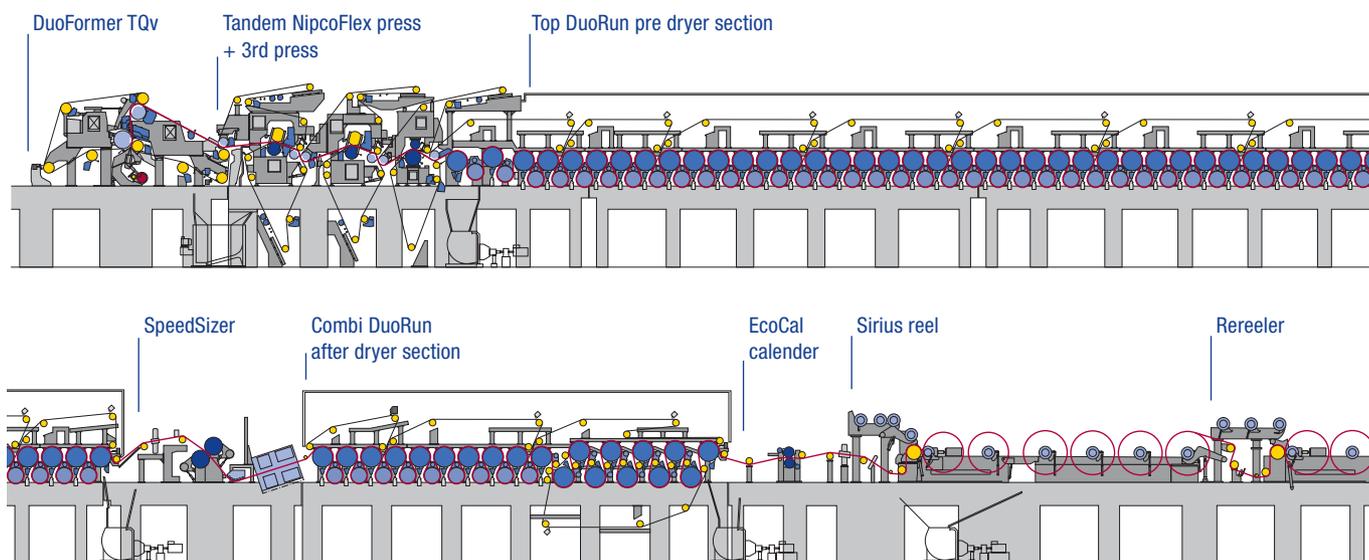
Ecological location advantages

The city of Nantong in the province of Jiangsu was selected as the location for Oji Paper's first paper mill in China. Nantong is at the mouth of the Yangtze River and offers optimal preconditions as a location

due to the good infrastructure of the economic and development zone there and the proximity to Shanghai. "Due to its proximity to the Yangtze River, we can get the water from there. In addition, we have access to the sewer built by the municipal authorities to the Huang Hai Sea. From an ecological viewpoint, this is another advantage of this location," says Hiroyasu Hayano, manager at Jiangsu Oji Paper.

Long-term service support

A special feature of the project is the proximity to the Voith Paper location in the Chinese city of Kunshan. This also simplifies collaboration after startup of the facility. Only a one-hour drive from



>>> Info: Nantong PM 1

The Nantong PM 1 produces fine paper and coated wood-free paper in the basis weight range of 40 to 190 g/m². With a wire width of 8,200 mm, it is designed for production speeds of up to 1,600 m/min. Along with stock preparation for processing the pulp delivered as bales, the facility consists of a paper machine with SpeedSizer and EcoCal calender, a rewinder, off-line coating machine, two Janus calenders and two winders.

In addition, the delivery includes the entire process equipment such as piping, containers, tanks, pumps, mountings, instruments, steam and condensate system, machine ventilation technology with drying hoods and an extensive automation package with process control system (DCS), quality control system (QCS) and electrification.

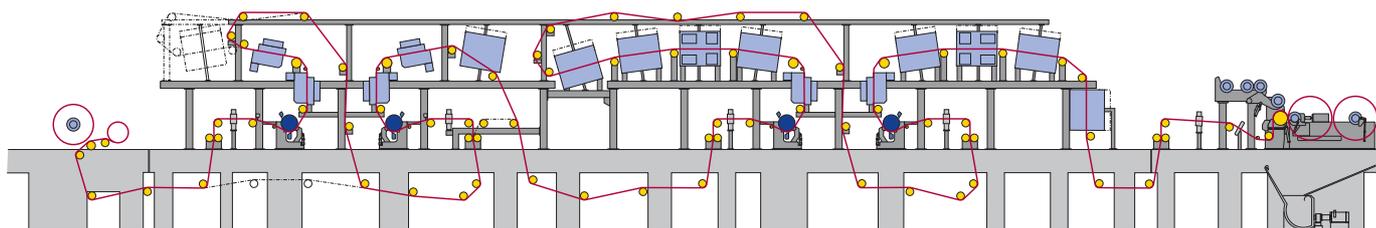


>> **Info: Oji Paper**

The Oji Paper Group with headquarters in Tokyo, Japan, was founded in 1873 and consists of Oji Paper Co., Ltd, as well as 193 subsidiaries and 84 affiliates. These companies are active in a wide range of business fields, including pulp and paper products. Additional business fields include the production of chemicals for the papermaking process or wood and tree-planting. Oji Paper produces graphic, board and packaging, tissue and specialty paper grades.

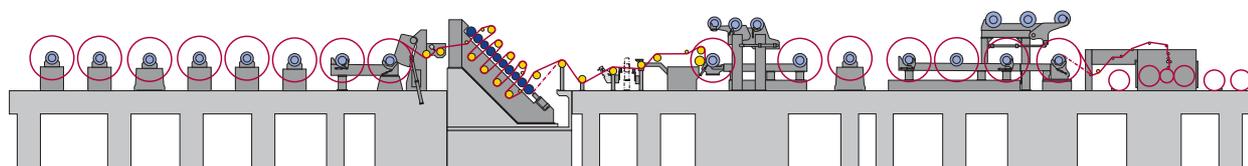


Off-machine coater with 4 blade coaters



2 off-line Janus calenders

VariPlus winder



Nantong, the entire know-how of Voith Paper and quick support if needed are available here.

Since the time during and after startup is a big challenge for the newly assembled maintenance teams, Oji Paper concluded a mill service consulting contract for three years with Voith Paper for the PM 1. The professional consulting in planning the maintenance and service work and the supervision of repair work are decisive for quickly achieving production and efficiency goals. Thanks to the service contract and the cooperative collaboration of Voith and the Oji Paper Nantong maintenance team, effective service is assured along with high plant availability.

For support with maintenance and troubleshooting, a seven-member team from Voith Paper is on site, taking care of the mechanical, hydraulic and pneumatic systems as well as lubrication and automation. In addition, the grinding of rolls and service for suction, press and

spreader rolls is taken over by the Voith location in Kunshan. For this, a framework agreement was concluded, which simplifies handling of these orders and offers additional economic advantages for Oji Paper.

Prospects for the future

Oji Paper is already planning the next expansion stages: Thus in the future the pulp required for paper production will no longer be imported, but rather produced on site in a new pulp mill at the Nantong location. The preparations for construction of this pulp mill, which will be designed for the needs of two paper machines, are fully underway. In order to ensure the supply of raw material, Oji Paper has acquired tree plantations in China. Also, the expansion of the paper mill with a second paper machine has already been approved by the Chinese authorities. These planning steps show how Oji Paper wants to strengthen its presence in the Chinese market to participate in China's increasing demand for paper.

Location

China



The city of Nantong is not far from Shanghai, on the northern bank of the Yangtze River. One of the special features of the economically up-and-coming city is that many Japanese companies have their Chinese headquarters here. The infrastructure in Nantong is ideal: the city is linked by expressways in all directions and has a large seaport.

Contact



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With new plants, a system provider is in



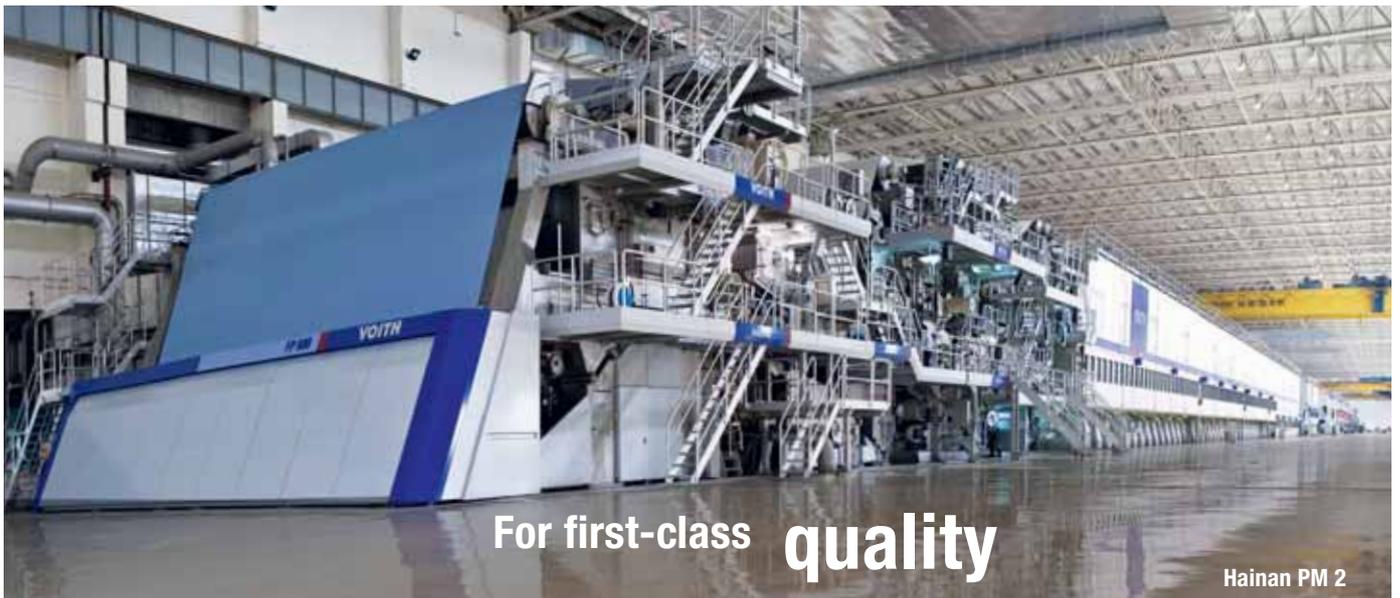
For highest **speeds**

King's Lynn PM 7

The design speeds of the latest projects speak for themselves:
 2,200 m/min newsprint (PalM GmbH & Co. KG, King's Lynn PM 7)
 2,000 m/min fine paper (Asia Pulp and Paper, Hainan PM 2)
 1,500 m/min fine paper (Moorim Paper Group, DongHae PM 1)

Process know-how leads to records

With new plants, Voith Paper shows its strength as a system provider with in-depth knowledge of all processes in the global paper industry. The main focus is on paper machines that play a leading role in efficiency, quality, speed, safety and environmental friendliness. The latest examples highlight these strengths: King's Lynn PM 7 (PalM GmbH & Co. KG), DongHae PM 1 (Moorim Paper Group), PM 1 in Nantong (Oji Paper Co. Ltd), PM 7 in Perlen (Perlen Papier AG) and Hainan PM 2 (Asia Pulp and Paper).



For first-class **quality**

Hainan PM 2

It is not just sophisticated technologies that are required to produce high-quality paper. Beyond that, comprehensive knowledge of the papermaking process and the factors that influence it are essential. Voith Paper's decades-long experience ensures the desired paper quality at a constant level.

Furthermore, the high quality of the processes and products make exceptional projects such as Hainan PM 2 possible. In constructing the largest paper machine in the world, Asia Pulp and Paper (APP) needed a quality supplier and chose Voith Paper.

demand

With all orders, Voith Paper's comprehensive know-how and many years of experience were decisive. Thus, for example, the One Platform Concept is acknowledged as a milestone for standardization. As professional project execution of these complex systems becomes ever more important, Voith systems meet these demands head on. So that all the components in a project could engage with each other like cogwheels, Voith Paper developed the Process Line Package. This meant the world's largest production facility for newsprint in King's Lynn could be built in only 16 months.



For more environmental awareness

Perlen PM 7

The world's largest deinking facility is at Palm Paper in King's Lynn, England. Every day, 1,500 oven-dry tons are turned out. Moorim Paper has ordered the first integrated paper mill for South Korea, with the DongHae PM 1 from Voith. Through the resource-saving overall concept used at Perlen Papier in Switzerland, power and steam use were minimized leading to noticeably lower energy consumption. Even the consumption of virgin fibers was reduced.



For increased efficiency

Nantong PM 1

Voith Paper's One Platform Concept concentrates not only on the overall process but above all on the life cycle of the products. It also includes maintenance work, rebuilds and services for continuous process improvements. The One Platform Concept permits the supply of complete packages that are precisely matched to the requests and requirements of the individual customer. With the Process Line Package, Voith simplifies the engineering, assembly, startup and training processes. Thus Oji Paper awarded the Nantong PM 1 to Voith Paper as a total package. The advantage: fewer interfaces, quick coordination and full use of Voith's process know-how. The result: an efficient project execution and an efficient paper machine.

Rebuilds increase added value and improve



Efficiency
increased

Higher runability and shorter roll change time

A new deflector on the headbox at Adolf Jass, Germany, improves the paper quality and increases the runability of the machine. The rebuild of the winder has more than halved the change time of the parent rolls at Burgo Ardennes, Belgium.

Components from Voith Paper suitable for every type of machine

Quality, productivity and production costs are the measure of all things in the paper industry. Rebuilds and modernizations ensure that production lines are up to date and improve their performance. The added value can thus be increased and the highest levels of efficiency, quality, speed, safety and environmental friendliness are attained.



Active
environmental protection

Less need for energy and fresh water

At SCA Witzenhausen, Germany, energy use has been significantly lowered by rebuilding the pre dryer section.



Speed
increased

Component replacement for higher web speeds

The new threading system with internal Venturi vacuum technology in the PM 1 at Rhein Papier, Germany, allows reliable threading at a speed of up to 2,200 m/min.

the eco-balance

Particularly when it comes to rebuilds, Voith Paper views the production line and processes as a whole – from optimization of raw material to roll handling. It does not matter whether the paper machine is small or large, decades old or still relatively new. The goals are minimal investment costs due to the most extensive use of intact components, short downtimes and quick amortization of total costs.



Fewer breaks and reliable drives

The PM 6 at Nettingsdorfer, Germany is a prime example of how availability can be increased through rebuilding. Voith drives in the entire dryer section give energy savings and reliable operation. Since Weig Karton relocated the doctors on the wire drive roll by 90 degrees on the KM 6 in Mayen, Germany, breaks have been noticeably reduced.



The winder rebuild at Kübler & Niethammer, Germany, had the effect of increasing the speed. Furthermore, the winder was brought up to the current safety standard.



Reducing downtimes

The Slovakian Ruzomberok PM 18 of the Mondi Group is well-known as the world record machine for Single NipcoFlex presses. To keep this record into the future, the machine undergoes regular preventive maintenance; which brings the steam joints and spoiler bars, for example, up to the current technical state of the art.

Curtain up for the DF Coat

First Curtain Coater in board production

Perfect coverage and outstanding print characteristics. No more and no less than this is required for the coat application. That's why board producer Mayr-Melnhof relies on the Curtain Coater from Voith Paper.

At the Austrian location of Frohnleiten, an air knife had previously been used in the BM 3 for the middle coat. The unit led to some limitations. The maximum machine speed was 550 m/min and the maximum solids content was 42%. In addition, coverage of the board by the air knife was only moderate, and the running characteristics were impaired by breaks and frequent cleaning intervals.

In order to eliminate all these limitations, a Curtain Coater was installed with the aim of replacing the air knife over the medium term. The main delivery consisted of the DF Coat with precision nozzle, which is essential for uniform profiles in CD and MD direction. Also, a very effective air boundary layer remover was ordered along with a modification of the web guiding system, a climate hood and an optimization of the infrared drying to facilitate further speed increases and energy savings.

An important component was the complete working station including a high-power vacuum deaerator. With curtain coating, it is essential to remove even the very smallest air

bubbles from the coating color – because where there is air, there cannot be any color.

Higher quality and speed

After the first few months in operation, the results achieved are quite impressive. First of all, the increase in quality is remarkable. Applying the middle coat with the DF Coat visibly improves coverage and cloudiness. This can be seen quite well, for example, with dyed samples of triple-coated board.

In addition to the enormous increase in visual characteristics, there is also an unchanged end roughness as compared to the air knife. Furthermore, the flatness of the board has improved, since less moisture gets into the board through the coating color.

As far as runability is concerned, the previous speed limitation due to the air knife no longer applies. An attempt is being made to increase the machine speed of the BM 3 to 1,000 m/min. The general performance is very good – there have been neither any breaks on the DF Coat nor have there been

any plugging of the nozzle so far. Even threading through the coating unit worked very well.

Advantages for the customer and the environment

The DF Coat is operated in its total speed range with a coating color of approximately 60% solids content, which is a clear increase, leading to a substantial reduction in energy costs of over 40% for the middle coat line.

With the higher solids content in the coating color, the amount of latex used could be reduced by 2% in the first step. Further savings are possible



Josef Gombocz and Johann Eggenreich from Mayr-Melnhof with Andreas Hosemann and Stefan Reich from Voith Paper (from right to left) inspect the newly installed Curtain Coater. The nozzle needs only a few seconds to move into its working position.

with changes in the pigment composition. In the area of raw material, input savings are also possible.

After only a short time in operation, the high expectations for the first installation of a DF Coat in a board machine were met and even exceeded. Thanks to further optimizations achieved by the customer together with Voith Paper, it is possible to increase the quality of the product while increasing the machine output at the same time. These advantages are supplemented by cost savings and an improvement of the global footprint.

“When the DF Coat runs, it runs.”

The fact that it should be >>> [Mayr-Melnhof](#) in Frohnleiten to order the first DF Coat is no coincidence. The company’s innovative spirit has been well known for a long time – the first shoe press ever used in board production is running in the company’s BM 3.

“Nobody wants to be the first, but everybody wants to be the second, and that applies especially to curtain coating. The DF Coat in itself, however, is a simple piece of equipment. What makes it somewhat

more elaborate is all around it. In particular, it needs a constant temperature, reduced air drafts and only a small amount of air in the color,” says Josef Gombocz, Director of Coating Technology at MM Karton, about the coater’s special features.

All these things are relatively easy to provide. The DF Coat has its own hood for creating the optimal climate. Therefore, the ambient temperature remains constant, and disturbing air drafts are a thing of the past. The air boundary layer remover eliminates the air that comes with the paper web, and the deaerator removes the air in

>>> Info: Mayr-Melnhof Karton GmbH

The Austrian company Mayr-Melnhof Karton GmbH is the world’s leading producer of coated recycled board and the largest producer of folding box board in Europe. The Frohnleiten mill, founded in 1888, is the parent mill of the MM Karton Group. The products are to some extent converted within the company. With an annual production volume of more than 40 billion folding boxes, MM Packaging, the packaging

division of the MM Group, is one of the largest folding box producers in the world. Constantly striving for high efficiency and quality improvements aroused MM’s interest in curtain coating several years ago. After several tests and intensive discussions with Voith Paper, the first Curtain Coater for board was installed. The DF Coat S started operation in Frohnleiten mid-June 2010.



the coating color. It has taken its place in the former forklift room alongside the BM 3.

“When the DF Coat runs, it runs: simply and without any adjustments. You don’t have to go into the hood at all. We installed two cameras for monitoring so that in the control room they always know what’s going on,” says Helmut Huss, Mill Manager in Frohnleiten. Maintenance of the DF Coat is utterly simple. Spare parts are rarely required, and during operation the maintenance effort is extremely minimal.

The perfect color developed together

It was a big challenge to develop a suitable coating color, since the ultra-thin curtain must not tear if there is a draft of air. Together with Voith Paper, Josef Gombocz developed the perfect color composition for this. The amount of color in circulation is much lower than that in a conventional coating unit. The difference can be

The amount of color in circulation is very small.



Due to higher solids content of the coating color, energy in the drying section can be saved.

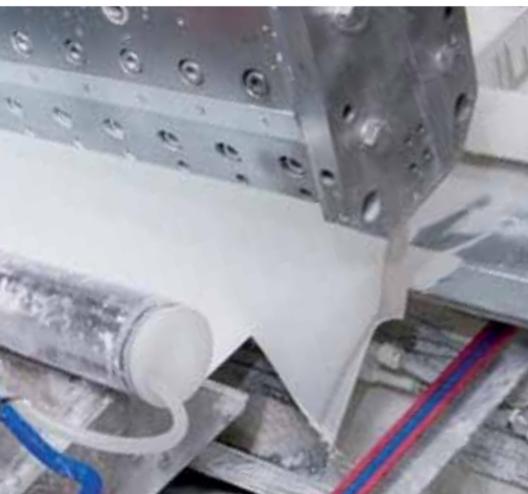
seen in the smaller dimensions of the pumps, among other things.

Of course, there are also doubts when you tread new paths – in this case, especially regarding the amount of air in the coating color. In operation, it turned out that these concerns were unfounded. Josef Gombocz is impressed: “Even though all pipes were full of air after a shutdown, we still didn’t have any air in the color.”

The first results reinforced Mayr-Melnhof’s pioneering decision: using the unit is easy, threading at the DF Coat works fine, the end

Maintenance of the DF Coat is extremely simple.

quality is excellent, and the energy savings are remarkable. “The whole team is delighted with the new unit,” says Huss. The Project Manager of MM Karton, Edmund Stadlhofer, summarizes the rebuild project briefly. “There is not much that is new in coating technology – with one exception.” He points to the DF Coat: “This is the future.”



Location



Frohnleiten is located in the Austrian federal state of Styria, approximately 170 km south of Vienna. The small town is located on the Mur river, in a picturesque valley surrounded by mountains. Frohnleiten looks back on a 700-year history, and it has about 6,100 residents.

Contact



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Project goals

- Double hydraulic capacity from 500 m³/h to 1,000 m³/h
- Double COD load from 25 t/d to 50 t/d
- Rebuild during ongoing operation
- Reuse as much as possible from existing system
- Lowest possible investment volume
- Simplification of operation

Secondary clarifier at Perlen.

Double capacity: rebuild of the clarification facility within the Process Line Package

Perlen benefits from tailor-made waste water treatment

At Perlen Papier AG, Voith Paper demonstrated how a waste water treatment plant can be rebuilt during ongoing operation in order to double its capacity. With the rebuild, the hydraulic quantity was increased from 500 m³/h to 1,000 m³/h. Instead of a COD load of 25 t/d, today the facility is designed for a capacity of 50 t/d COD.

At the beginning of 2009, Perlen Papier AG decided to expand its production by adding a new Voith paper machine with stock preparation. From the beginning, it was clear that with this investment – despite use of the most modern paper machine technology – the hydraulic waste water quantity and the COD load of the waste water was expected to be double. Since the existing clarification facility was

not designed for this, Voith Paper worked out a plan for the expansion of the plant. It included an increase in capacity with extensive use of existing system technology.

Expansion during ongoing operation

A particular challenge of this rebuild was that operation was supposed to continue at all times and thus

replacement solutions were necessary for the rebuild of existing units. Based on a thorough analysis of all boundary conditions, several possible expansion scenarios were developed. Perlen Papier ultimately decided to continue relying on purely aerobic waste water treatment. The final system comprises two identical waste water treatment lines. Both individually adjustable lines take half of the total load.

New reactors increase treatment efficiency

For the rebuilding of the clarification facility, the latest generation of >>> Moving Bed Biological Reactors (MBBRs) were used. The treatment efficiency of the existing basins can be increased by means of the new high-performance carrier. Therefore, only one additional MBBR was needed to double the capacity. The following activated sludge system was changed to a cascade with fine bubble aeration. This led to significant savings with regard to energy and space requirements. The existing secondary clarification tanks were upgraded to improve their performance and an additional MERI secondary clarification tank was built in order to handle the new volume flow. Intermediate pipe lines were installed so the new components could be seamlessly put into operation. Like this, other components could be taken out of operation for rebuild. An obsolete side line with low capacity was shut down.

Rebuild in 4 phases leads to success

The smooth course of the changes during ongoing operation was critical to the success of the rebuild. In the first step, an additional MBBR and the new secondary clarification basin were installed. The discharge edifice to the receiving water was also moved to another location. Altogether with new pipe routes, the preconditions were now set for initiating the next rebuilding measures.

>>> Info: Moving Bed Biological Reactors (MBBR)

The MBBR reactor is a key component of aerobic waste water treatment. These types of reactors are mostly suitable for low to medium concentrated waste water with COD concentrations below 2,000 mg/l. Carriers provide a surface on which the activated sludge can grow. Typically, in MBBRs up to 50% of the COD load is degraded within a small volume. The carriers covered with biomass can be kept easily in the basin by means of a retention basket. Due to the very thorough mixing and the large available surface on which the carriers, the level of mass exchange and biological activity is high.

In the second step, the side line was shut down and an activated sludge basin and secondary clarification basin were taken out of operation. Within a few days it turned out that the new components were operating successfully and the rebuild of the components taken out of operation could begin.

In further steps, the rebuilt basins were put back into operation and others were freed for the rebuild. After the last rebuild, the full capacity of the waste water treatment system was available in good time prior to the startup of the new paper machine.

Novel carrier material shows its impact

The novel carrier material used in the MBBR reactors at Perlen is attractive due to its higher performance. In comparison with conventional carriers, it has an active surface that is up to six times larger per cubic meter of material used. Along with a sufficient and uniform air supply, this is decisive for high effectiveness. The carrier material is porous so that the bacteria can be immobilized in the pores. The carriers resemble round plastic chips and their size is roughly that of a 1 euro coin. A special feature of the plastic chips is that compared to

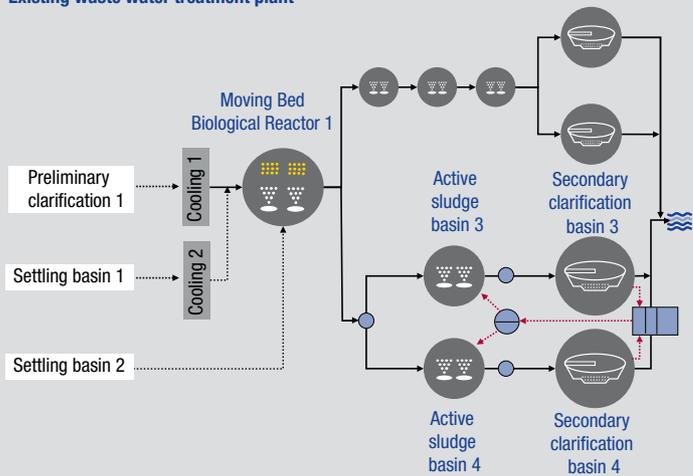
conventional carriers they cannot clog. The carrier material continues to keep its good fluidization characteristics and high degrees of degradation. For this reason, the conventional carriers in the existing MBBR were also replaced.

In order to achieve the specified discharge values, further activated sludge treatment is required after the high load stage. In modern facilities this is designed as completely mixed cascaded basins. For aeration in this area, porous hose-shaped aerators are used, which have low energy consumption and contribute to the high operational reliability of the facility due to their rugged construction. A scraper bridge with a suction scraper from MERI is installed in the new secondary clarification basin. Additional monitoring units, sludge level measurement and floating sludge detection allow automatic operation. Wireless data transfer



Thanks to the large active surface, the novel carrier material shows a high performance.

Existing waste water treatment plant



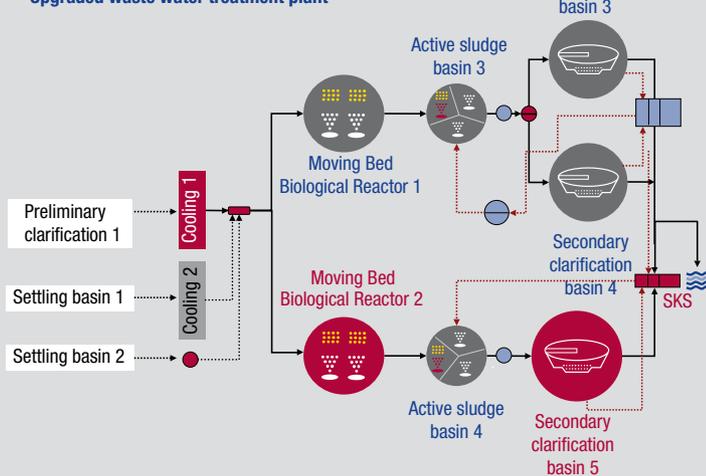
System configuration before rebuild.

feeds the operational data of the clarifier to the control system of the paper mill. The amply dimensioned floating sludge removal device is automatically activated. Another special feature of the secondary clarification is the clear water removal equipment. It is submerged so that no growth of algae can occur at the outlet duct, which is often a problem with conventional serrated weirs. In addition, it allows uniform removal independently of weather conditions.

Performance tests during the rebuild phase

Careful planning by Voith Paper already paid off in the implementation.

Upgraded waste water treatment plant



System configuration after rebuild.

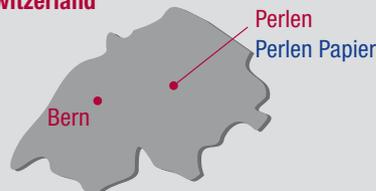
The intention was to use the existing biomass during the conversion in order to keep the treatment efficiency at a constantly optimum level. During the rebuild of the old reactor, the new MBBR thus had to deal with loads that were noticeably higher than it was designed for.

Short communication routes, very good coordination of the individual components and few interfaces were advantages of the Process Line Package that persuaded Perlen Papier to award the entire project to Voith Paper. Responsibility for the paper machine, stock preparation and waste water treatment thus came from one source. This led to a smooth rebuilding process, so

that the full capacity of waste water purification was available at an early stage before the startup of the new paper machine.

Location

Switzerland



The small village of Perlen is surrounded by mountains in the southwest canton of Lucerne in central Switzerland. It is between the Reuss and Ron valleys, not far from Lake Lucerne.

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Retention basket for MBBR carriers.

Initial results of the new OnQ ModuleJet actuator

Rapid modernization on the headbox

Board producer Moritz J. Weig GmbH in Mayen needed a solution for its outdated profile controller system on the headbox. Because of the harsh environment, the actuators no longer worked reliably, so that along with downtimes, there were unwanted fluctuations in the basis weight profile. With the customer, Voith Paper developed a cost-effective modernization solution in which the new OnQ ModuleJet actuators were used for the first time.

In order to make the existing system resistant to the rugged environment, an overhaul of the 79 actuator motors was necessary. However, Voith Paper had another suggestion that turned out to be technically ideal for the requirements of Weig Karton: the newly developed OnQ ModuleJet actuator. Thanks to its compact design, a high protection class (IP67) and thus greater reliability, and serviceability, this proved to be the most economical solution.

Low investment ensures high availability

The OnQ ModuleJet actuator series facilitates cross-profiling on headboxes with dilution technology. The combination of the OnQ Profilmatic control software and

OnQ ModuleJet actuator system guarantees good and uniform basis weight cross profiles. In order to withstand the difficult operating conditions and guarantee high availability, OnQ ModuleJet offers some important advantages:

- Separated from the motor unit, the electronics can be installed so they are protected from the white water
- One electrical unit controls up to eight actuators and takes on the communication with the OnQ Profilmatic control computer

- Depending on the valve construction, the actuators can even be exchanged during operation within 10 minutes, without parameterization
- The actuator meets the protection class IP67 – it is protected against environmental temperatures up to 70°C and water jets
- A faster and more secure Ethernet field bus (100 Mbit) allows extensive diagnosis up to the motor unit

In a project time of just four weeks, Voith Paper developed an automation

“A thoroughly successful upgrade, no profile problems, no downtimes!”

Thomas Ganster, project manager of the OnQ ModuleJet upgrade, Weig Karton



Separate, protected installation of the electrical units.



An upgrade of outdated headboxes is possible through a simple rebuild.



“We are impressed by this innovative Voith solution.”

Henning Dippel, KM 6 operations manager, Weig Karton

“Although the project was decided on at very short notice, only around five weeks from placing the order to startup, everything went off without a hitch. Since the upgrade, there has not been a single malfunction in the hardware or software. We are impressed by this innovative Voith solution.”

concept to increase the efficiency of the KM 6. In two days of downtime, employees of Voith Paper and Weig Karton worked together in the field to exchange the 79 actuators and lay the cable. The computer network and the data connections were also inspected and renovated. The OnQ Profilmatic hardware and software were upgraded and connected to the customer’s operating data capture system via an OPC link.

The actuator network was implemented via Ethernet, with an optical fiber connection between the computer cabinet and motor control unit. In addition, an extensive replacement parts package was put together and an on-call service contract was concluded. This service ensures that a malfunction will be corrected as quickly as possible.

Challenge in Mayen

Pivotal in the modernization of the KM 6 were production malfunctions that had occurred repeatedly since 2008 as a result of failures in the area of the headbox. The system installed in 2001 for the cross-profiling of the MasterJet FB headbox was out-

dated, so that the actuator motors and distributor boxes were, in part, no longer able to withstand the typical harsh installation conditions of a board machine. The aggressive environment led to heavy corrosion of the connection elements of the distributor boxes. The operators of the KM 6 recognized that, after 10 years, even the most robust system would be subject to breakdowns at that spot. The poor accessibility of the section at a height of approximately seven meters in the upper part of the headbox also made the exchange of the actuators difficult.

In order to improve the situation, Weig Karton turned to Voith Paper in their search for a solution. Based on years of cooperation, the partners quickly found a solution approach and agreed on a rapid implementation.

Economic results

The upgrade of the OnQ ModuleJet control system on the KM 6 took the specific requirements of Weig Karton into account, but nevertheless can be used in many other headboxes. The compact design of the actuator

allows easy rebuilding. The new actuator system is also practically maintenance and service free. Since the upgrade of the KM 6, Weig Karton has achieved a higher overall availability and thus a significant improvement in efficiency. Since startup, the system has operated without a malfunction.

Location

Germany



Mayen
Weig Karton

Mayen is approximately 30 km west of Koblenz and is called “the gate to the Eifel” because of its location. The city of about 18,800 inhabitants is home to companies in the board industry, engineering, and aluminum and plastic processing.

Contact



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The ScreenFit Doctors are active worldwide. From left to right: May Fursey for North America (may.fursey@voith.com), Christian Steinmassl for Europe (christian.steinmassl@voith.com) and Gerhard Veh for Asia (gerhard.veh@voith.com).

The ScreenFit Doctors from Voith Paper in action

Operation “Screening Section Optimization”

Avoiding spinnings, paper production with 30% recycled fiber and reducing energy consumption – even seemingly minor improvements, especially in the pulp-screening phase in a stock preparation plant, can result in major benefits for paper manufacturers. Voith Paper’s “ScreenFit Doctors” are active worldwide to provide long-term improvements for all screening applications.



that the rotor was running at its maximum output. In addition, the continual formation of spinnings in the slot basket significantly reduced overall screening efficiency. Here, the customer's requirements were to improve the machine's screening efficiency and reduce its energy consumption.

Avoiding spinnings

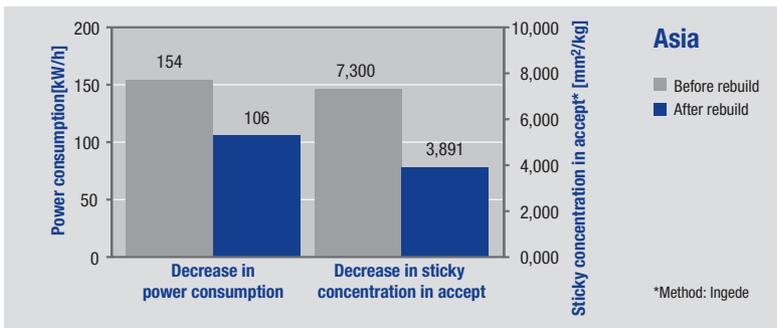
To achieve these goals, Voith Paper's Doctors upgraded the plant's fractionator with proven C-bar Screening Technology and a new MultiFoil rotor. In China, operational testing by the customer resulted in significant improvements: A streamlined MultiFoil blade profile eliminated the spinning problem. Also, energy consumption was cut by 30%, and sticky concentrations in the accepted stock were reduced by 50%. As a result of these improvements, the customer could save 27,000 euro per year and reduce CO₂ emissions by 18.7 tons per year.

Paper production with 30% recycled fiber

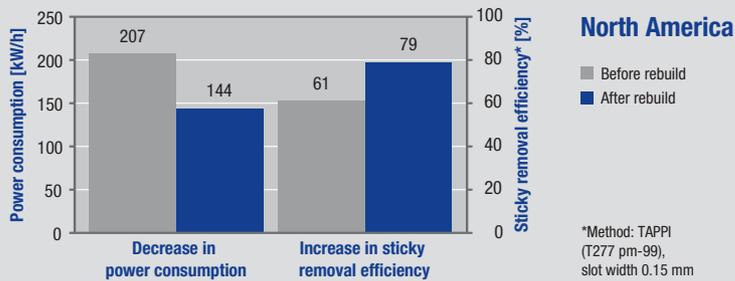
In this example, because of market conditions in USA, the customer was required to use between 10% and

The ScreenFit Doctors' first assignment was at a board and packaging plant in southern China. The initial analysis revealed that the

plant's Metso-Tampella fractionator was operating with accepted stock that had an extremely high sticky concentration of 7,300 mm²/kg and



Asia results case study with MultiFoil. The right picture shows a rotor of a non-Voith TLA 450 screen with spinnings at the foil blades.



North America results case study with EcoRotor and C-bar Q screen basket.

30% recycled fiber in the furnish blend of its high-quality papers. As a result, the presence of stickies became a major problem for the machine, which had been using a three-stage horizontal screening system.

Here, Voith Paper's ScreenFit Doctors replaced the original rotor and bar screens using 0.2 mm slot width with EcoRotors and with 0.15 mm C-bar Q screen baskets. In addition, the mill upgraded the screening section from three stages to five stages, equipping stages four and five with new MultiFoil rotors, 0.15 mm C-bar screen baskets, and FiberLoop as recovery technology. Enlarging the screening section and using this new equipment enabled the customer to produce quality paper from 30% recycled fiber. At the same time, sticky removal was improved by 30% and energy consumption was cut by 30%.

Reducing energy consumption

At a LWC paper mill in Germany, the ScreenFit Doctors had to reduce the mill's energy consumption by 20% and improve the paper mill's overall output – without compromising the quality of the raw stock processing.

When the Voith Paper Doctors arrived, the customer's DIP tailing screen MST 05/05 was equipped with a step rotor and a Contour basket, which was operating with a 4% pulp consistency and a tip speed of 20 m/s. Here, the ScreenFit Doctors installed the newly developed, energy-saving Eclipse Rotor, with a streamlined blade profile. The results were convincing: Extensive tests on the customer's machine showed energy consumption cut by 25% while output simultaneously increased 20%. Additionally, the new rotor

improved screening efficiency by as much as 30%.

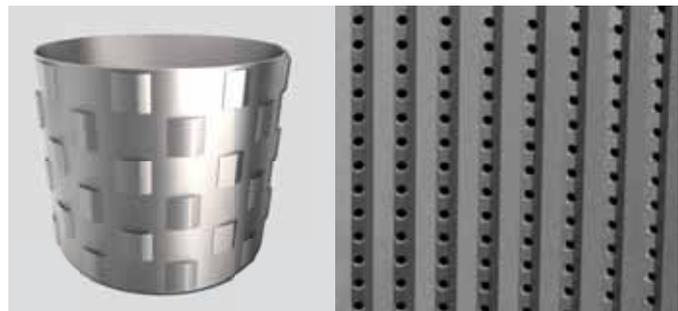
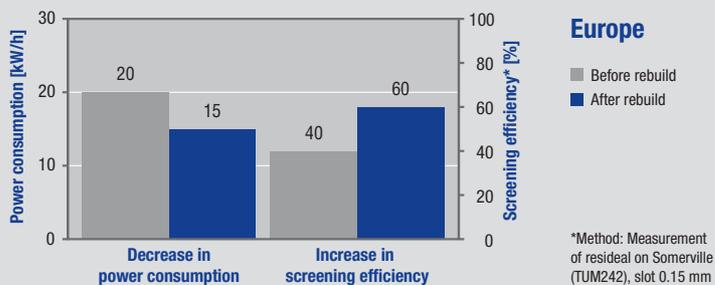
ScreenFit – a successful concept

Voith Paper ScreenFit Technologies offer individually tailored solutions for a wide range of raw stock screening requirements. The modernization of complete screening lines, the upgrading of equipment from external suppliers, and the installation of innovative products from Voith Paper are some of the classic applications performed by the ScreenFit Doctors.

Contact



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Europe results case study with Eclipse Rotor and Contour basket.

Non-contacting caliper measurement with Voith LSC QuantumSens

“Our experience has been impressive”

Mitsubishi HiTec Paper is one of the world’s leading manufacturers of specially coated grades such as carbonless paper, digital imaging and thermal paper. The company required exact caliper measurement for the SM 3 at its German Bielefeld site to further increase caliper profiles in the course of a planned process analysis. After a long search, Mitsubishi finally found the sole product that met all its stringent requirements: the Voith LSC QuantumSens.

“Our experience with the new Voith LSC QuantumSens has been impressive. This new caliper sensor has provided us with true, non-contacting caliper measurement that is accurate and reliable. It has never marked the sheet, nor has it been responsible for any breaks. Our machine operators trust the new sensor and it has given us a valuable insight into the quality of our products from coater SM 3.”



*Jürgen Heitland,
Head of MSR, Mitsubishi
HiTec Paper Europe
GmbH, Bielefeld Mill.*



E-Flex – the new generation of press fabrics

Maximum dewatering performance from start to finish

E-Flex provides better paper quality, immediate startup of the newly installed press fabric as well as higher nip dewatering and corresponding dry content. A number of well-known paper manufacturers are using the structurally optimized felt in their presses to achieve these benefits.

It was the desire for better surfaces for high-quality board grades that spurred the Research and Development department to reconsider the structure of press felts. The result is E-Flex, a breakthrough in the position-specific design of press felts. The dewatering performance is provided from the beginning, due to the extremely uniform surface structure of the felt and the associated pore volume distribution.

Constant performance

This is achieved by targeted placement of polymer particles, which keep the felt characteristics constant over the entire running time. The polymer treatment penetrates into the

pores of the batt structure making them more homogeneous. An extremely high contact surface to the paper web is the result. This also controls uniform transmission of press loading in the nip. The integrated polymers perfectly bind the batt fibers and thus prevent abrasion-related fiber losses. The felt surface is preserved, pressure transmission is uniform and there is an extremely large contact surface to the paper. Optimizing the microstructure of a felt means less contamination can penetrate it. Cleaning with high pressure showers can therefore be carried out at reduced pressure, which in turn helps to preserve the felt surface. In addition, the porosity and dewatering behavior hardly change.

The performance of E-Flex remains constant over its running time. The result is constantly high dewatering with corresponding dry content. And since the added polymer particles give the felt structure long-lasting elasticity, longer running times can be attained, compared to standard felts.

So, with E-Flex, the operating lives in the test position in a board machine were nearly doubled in only a short time from the launch. In the case of a fast-running graphic paper machine, the life was extended by approximately 25%. The goal of a 33% increase is within reach. Along with an increase in running time, the improved dewatering performance remains in focus. In combination with

suitably optimized polyurethane roll covers for the suction press roll (SolarFlow), increases in dry content of more than 1% can be achieved. Most papermakers using E-Flex report maximum dewatering rates immediately after startup.

Broad range covered

These results show that the structural optimization undertaken with E-Flex enables it to be used in a broad range of paper manufacturing applications. E-Flex thus not only facilitates improvements in manufacturing for special paper or board, but also for fast, high-performance graphic machines.

The polymer structure with an improved rebound capacity of the felt gives stable dewatering characteristics over the entire running time. The optimally set pore volume controls the flow of water into and through the felt to the press roll cover or shoe press belt. Upon leaving the press nip, the

polymer structure of the felt prevents water from flowing back to the fine capillaries of the paper and thus re-wetting it. The structural optimization by means of polymers can be worked into various levels of the press felt, depending on the characteristics that are to be achieved or optimized. Of course, the respective press position or paper grade also prescribes the way a felt is constructed.

The paper side or the coarse batt layers can be modified with polymer particles. But this also applies to the basic structures and – if the requirement demands it – to the side of the felt not in contact with the paper.

The manner in which the polymers are placed or applied is extremely uniform. As the particles do not just remain on the felt structure but actually penetrate into it, proper treatment creates a three-dimensional network. This gives E-Flex long-lasting elasticity – the key to constant felt characteristics. Together with the

newly developed AquaFlow and SolarFlow polyurethane suction press roll covers, synergy components were created for a highly efficient press section.

On Focus: E-Flex

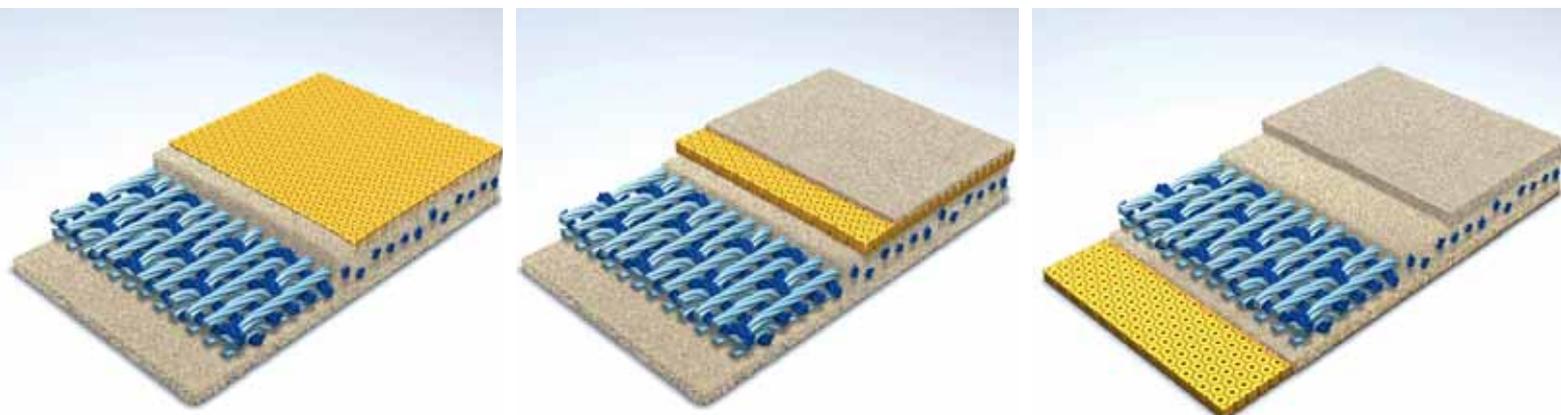
| | | | | |
|----------------|---|---|---|---|
| ProEnvironment | + | + | + | + |
| ProRunability | + | + | + | + |
| ProQuality | + | + | + | + |
| ProSpeed | + | + | + | + |

Section: Press
 Paper grade: Graphic papers, board, packaging papers

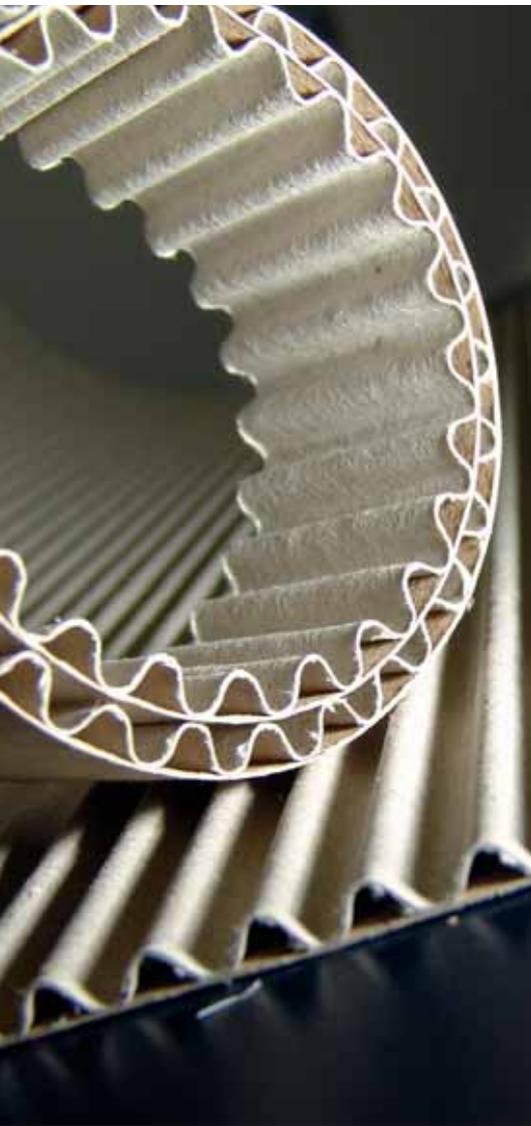
Contact



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E-Flex in different designs with position-specific polymer structure.



MultiForm IC – expansion of the I-series

New forming fabric design for board & packaging paper machines

In the wet end, forming fabrics such as the new MultiForm IC have a significant influence on the dewatering process and can thus help save raw materials, fibers and fillers. But efficient dewatering also means less energy is required for the drives of the fabrics.

After the successful introduction of the PrintForm IT and PrintForm IS products for graphic paper machines, this innovative product concept is now also being adopted for use with board and packaging paper machines in the MultiForm IC. The development objectives for the new MultiForm IC can be summarized by the following three benefits:

- Improved mechanical fiber retention
- Improved paper profile quality
- Reduced energy costs due to lowered drive power

MultiForm IC is a new product in the I-Series that was introduced a year ago and was already successfully tested in production facilities. What MultiForm IC has in common with PrintForm IT & IS is the innovative warp concept in the fabric design.

At a ratio of 3:2, more warp yarns are used on the paper side than on the bottom side.

In comparison to modern SSBs there are several benefits, as shown in the table below.

| Advantages of the innovative 3:2 warp ratio of the fabric design | | |
|--|---|---|
| | Changed fabric characteristics: | Advantages in paper manufacturing: |
| 1. | Higher number of support points on the paper side | Higher mechanical retention, improvement of formation, reduced fiber carrying |
| 2. | Reduction of yarn diameter on the paper side allows a smaller mesh thickness and thus less open volume in the fabric | Less water carrying |
| 3. | Larger warp diameters on the bottom side, which allow the use of larger weft diameters | Higher fabric bending stiffness for higher stability and cross profile improvement of the paper |
| 4. | Lower warp yarn density on the bottom side enlarges the open mesh surface on the bottom side | Less dewatering resistance of the fabric increases the dewatering capacity; vacuums of the dewatering elements can be reduced and can also decrease the drive power |
| 5. | Offset of the paper-side and bottom-side warps to one another creates many small dewatering capillaries in the fabric | Reduction of hydraulic markings |

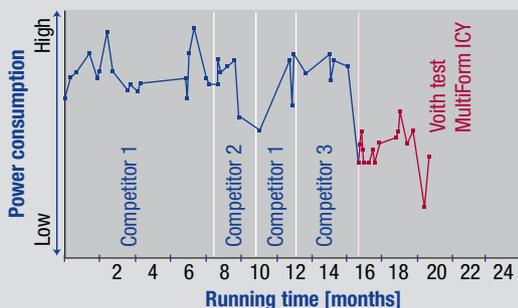


Fig. 1: Records of power consumption at suction couch roll.

| MultiForm | ICY | ICW | IKY | IKW |
|------------|-----------|-----------|-----------|-----------|
| Product | SSB | SSB | SSB | SSB |
| Type | Coarse | Coarse | Kraft | Kraft |
| Bonding | 2/8 shaft | 2/8 shaft | 2/4 shaft | 2/4 shaft |
| Weft ratio | 2:1 | 3:2 | 2:1 | 2:1 |
| Warp ratio | 3:2 | 3:2 | 3:2 | 3:2 |

Fig. 2: Development planning of the I-series for board and packaging paper.

Large operating window and high retention

Before being used in a production facility, MultiForm ICY and MultiForm ICW forming fabrics were tested under various conditions on a pilot paper machine. In the process, various fabrics were used on the bottom wire position of a DuoFormer D. The aim of these tests was to check the functioning of the new fabric design depending on various operating parameters. The new fabric designs were compared with modern weft-bound SSB fabrics and warp-bound SSB fabrics. If a fabric design performs well with a certain machine setting and this

performance also remains good if process parameters are changed, this is known as a wide operating window in which the fabric design can be used. Good results and large operating windows were achieved with MultiForm IC fabrics as became clear with the results of the SCT test (compression strength). At the same time, between 1.5 and 2.5% higher retention values were attained with MultiForm IC fabrics.

Energy saving with MultiForm IC

Production of high paper basis weights, in particular, requires a high expenditure of energy. The objective at a production facility for folding box

board was to reduce the energy costs. With the MultiForm ICY, energy savings were achieved through lower power consumption at the suction couch roll. The high dewatering capacity of the MultiForm ICY allows an operating mode with reduced vacuums, which led to a reduction of power consumption at the suction couch roll of 22-27%. The comparison was done during production over 16 months with SSB fabrics from three competitors and the respective consideration of three different basis weights.

MultiForm IC – developed to meet all customer requirements

MultiForm ICY views

MultiForm ICW views

MultiForm IC

Running time

- High wear volume for running times that can be planned
- High stability for reduced risk of damage

Running performance

- High open surface for good dewatering capacity
- Good fiber support for high mechanical retention and reduced fiber carrying

On Focus: MultiForm IC

| | |
|----------------|--|
| ProEnvironment | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> |
| ProRunability | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> |
| ProQuality | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |
| ProSpeed | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

Section: Former
Paper grade: Board, packaging paper

Contact

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Detecting problems in the wire section in good time

OnQ FormingSens increases efficiency at Koehler Kehl

OnQ FormingSens is the first online sensor to enable accurate, repeatable and continuous measurement of water weight in the former using high-frequency microwave technology. Based on these measurements, a range of optimizations can be realized in the former, such as savings in vacuum and drive energy.

Thanks to its technical features, OnQ FormingSens can be used for all former types and paper grades. It also helps to improve the runability of the paper machine and safety at work.

OnQ FormingSens has been in operation since September 2009 at Koehler Kehl GmbH, Germany. Installed in the PM 2, the sensor provides reliable data on the thermal paper produced.

“With the continuous measurement of the OnQ FormingSens, we can conduct in-depth analyses of our processes in the former. This allows us to react to problems in the wire section in good time and thus increase the efficiency of the paper machine.”



*Joachim Fuchs,
Deputy Head of Production
PM 2/SM 2, Koehler
Kehl GmbH*



Have you heard just how quiet paper machines can be?

Voith dBlocker effectively reduces noise

Faster production speeds and larger plants result in noise emissions that sometimes exceed the statutory limits. The noise levels around paper machines present the designers of a paper mill with the difficult task of developing efficient noise protection measures. Voith's new dBlocker effectively dampens the noise in machine and production halls and can be installed without impacting the production process.

The statutory requirements on workplace safety, in particular, (see separate information section "EU noise directives") mandate technical or organizational measures to reduce noise. The main sources of noise from a paper machine are generally the suction rolls of the wire and press sections. With very high broad frequency sound levels of around 95 to 105 dB(A), they produce a very unpleasant noise. Because this is where most of the noise comes from the current focus of the acoustical design process is on the wire and press sections.

Voith dBlocker – the “noise gobbler”

The basic effect of the Voith dBlocker is to absorb the airborne sound emanating in the machine hall using optimized sound-absorbing elements fixed to the ceiling and walls (Fig. 1). When sound waves encounter a dBlocker element they penetrate deeply into the absorption body where they convert much of their energy of oscillation into heat. This means substantially less sound energy is reflected back into the hall than on a smooth or rigid wall or ceiling, and the noise in the room is reduced. In particular, the innovative,



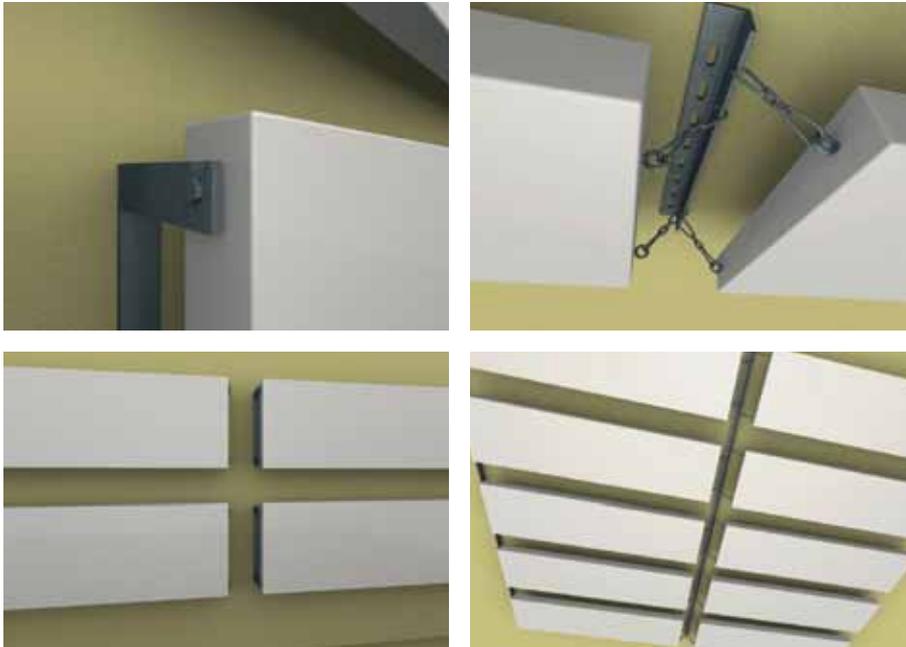


Fig. 1: Fitting dBLocker elements to walls and ceilings.

patented material combination used achieves exceptionally high acoustic absorption coefficients into the low-frequency range.

The Voith dBLocker consists of a combination of different fiber, foil and fabric materials, providing it on average with sound absorption

coefficients that are twice as large as comparable products available on the market (Fig. 2). Generally even just a few dBLocker elements will achieve highly audible improvements in the noise level. For example, installing an absorber area of less than 1% of the total PM hall surface area at a paper mill in Austria allowed

the noise level to be reduced by up to 3 dB (A) (Fig. 3).

Careful selection of the foil and fabric cover in combination with the fiber material allows the frequency-dependent absorption characteristic of the dBLocker to be perfectly tailored to requirements. This means it can be optimized to the surrounding sound field and planned target characteristic of the noise level.

Correct positioning of dBLocker elements

The noise from a production facility, particularly that from a paper machine, generally comes from many individual noise sources and spreads out in the machine hall. To create the greatest possible noise-reducing effect with just a few absorber surfaces, the dBLocker elements used have to be installed in the area where the noise sources are loudest. The maximum noise zone is usually determined by

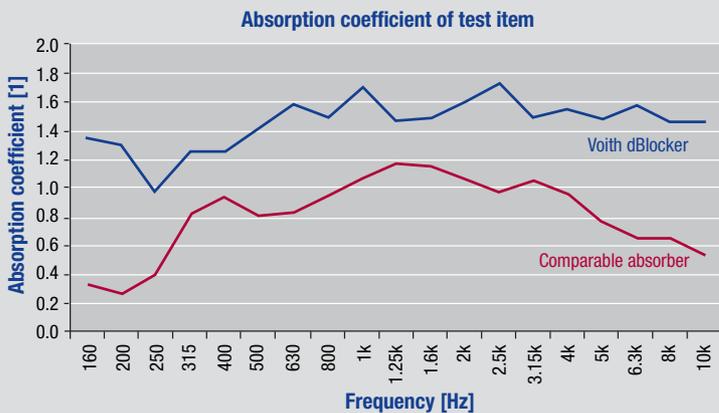


Fig. 2: Spectral comparison of sound absorption coefficients.

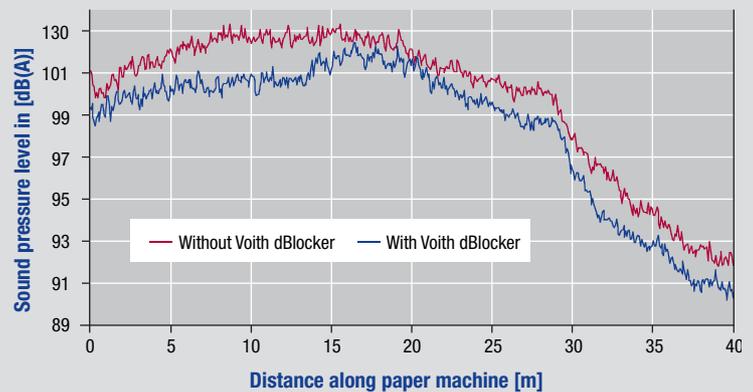


Fig. 3: Reduction of sound pressure level after installation of dBLocker in a paper machine hall.

means of systematic near-field measurements of the sound level of all possible noise sources. An acoustic camera (Fig. 4) can be used to accurately analyze the individual sources of noise from a paper machine.

Once the main sound sources are known, a sound propagation calculation of the production hall is carried out on the basis of the specified hall geometry. The result forms the basis for correctly dimensioning and positioning the dBBlocker elements.

Cold, heat, water – not a problem

The Voith dBBlocker was designed for a very wide range of ambient conditions: for temperatures below freezing but also high temperatures. When used for example in the dryer section, the high-capacity absorber retains its excellent acoustical properties. Due to the high level of water resistance in the multi-layer

surface, the dBBlocker can also be used to efficiently block noise in damp environments.

Less noise reduces error rate

Following installation of the dBBlocker elements adapted to the specific noise situation, a significantly reduced noise level can be expected in the hall and in the vicinity of the production facility. As workplace quality and noise exposure are directly linked, a quieter workplace has been proven to enhance the concentration and performance of personnel exposed to lower levels of noise. Even a reduction of 3 dB(A) will substantially reduce the propensity to make mistakes. Less noise is therefore a component of active accident prevention for the personnel employed.

EU noise directives

Since 2006 lower limits for noise pollution at the workplace have been in force all over Europe. In March 2007 the German government implemented the revised EU noise directive in a regulation to protect employees from noise and vibration hazards.

This directive specifies that employers must make hearing protection available from an average noise exposure of just 80 dB(A). For 85 dB(A) and above, hearing protection must be worn. Advice about noise limits and compliance, as well as possible noise protection measures at the workplace, can be obtained from the employer's liability insurance association, the occupational health and safety agency in your country, or the relevant advisory departments of specialized companies such as Voith Paper.

Within the framework of workplace prevention, noise has a significant role. According to EU estimates, around 60 million workers throughout Europe are exposed to noise during a quarter of their working hours. In the European Union noise-induced hearing loss is one of the most frequently reported occupational illnesses.

There are also many similar laws in force in Asia and America but they differ in terms of how restrictive they are.

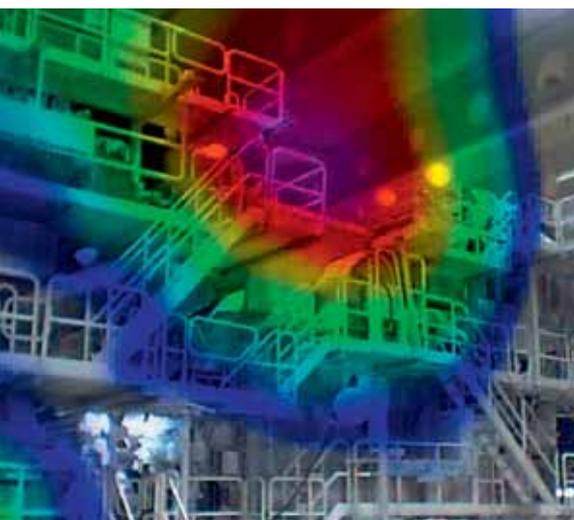


Fig. 4: Acoustic image of a suction couch roll.

On Focus: dBBlocker

ProSavety

ProEnvironment

Section: Primarily in the wet section; potential for use in entire machine hall

Paper grade: All

Contact



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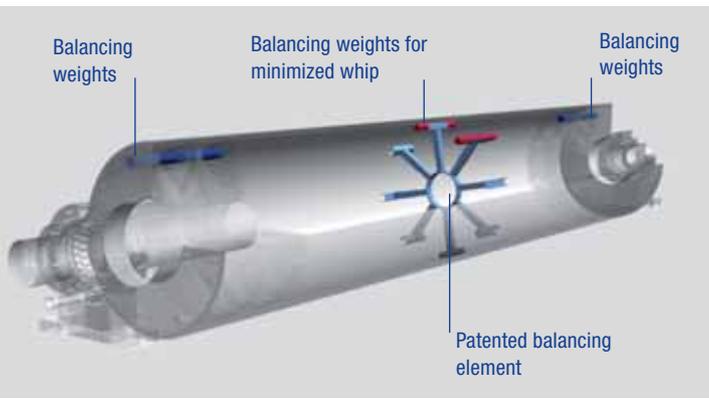


Fig. 1: Mechanical service components for improved roll balance.

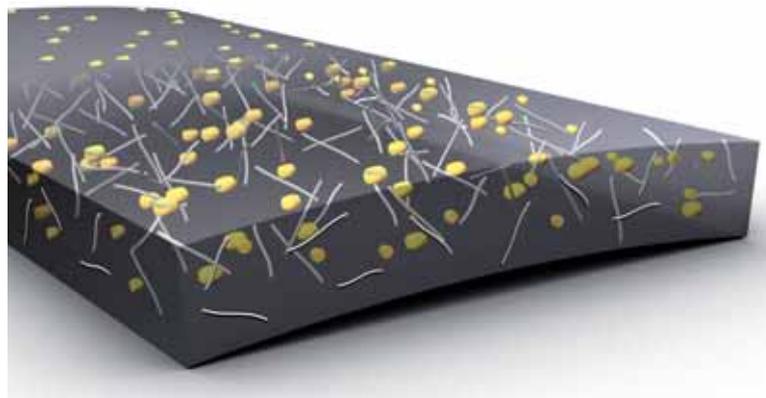


Fig. 2: LunaCoat E provides excellent impact and wear resistance.

Efficiency increase in coating with Luna covers and mechanical roll service

Product combination achieves improved coat weight profiles

A uniform coat weight profile significantly influences the printability of LWC paper. Profile problems will result in claims and sales shortfall. The quality of the coating application can be clearly improved by the utilization of a combined solution of mechanical roll service and Luna roll covers, thus enhancing the paper quality.

Some paper mills producing coated grades with blade coaters at speeds above 1,200 m/min have experienced high frequency coat weight variations due to instability of backing rolls and roll cover combination. Such variations cannot be identified via conventional quality control systems due to the high frequencies involved – typically between 4 and 18 Hz. Depending on the amplitude of coat weight variations, print quality (image definition) is negatively affected due to inconsistencies of paper properties such as ink absorption and gloss.

A paper mill in North America recently reported such defects. After a very detailed evaluation of process

variables by the mill, different solutions were assessed. It turned out that an “off the shelf” solution was not available and a trial and error approach would be very expensive as well as inefficient. Therefore, the mill decided to partner with Voith Paper to find a definite solution. A stepwise approach was taken in which risks were mutually evaluated and a forward path was established.

Background of the problem

- Printing tests and evaluation of the defect frequency were performed, following which it was found that such frequency could be traced to MD coat weight variation.

- The paper mill performed several TAPIO tests determining that the frequency of the variation was very repeatable and it matched the revolution of the coater backing roll. Most dominant frequencies were (by amplitude) at one time the backing roll rotational frequency.

Product combination as a solution

After understanding the root causes of the problem, specific products and services within Voith Paper’s existing portfolio were utilized and the amplitude of coat weight variation was significantly reduced as well as printing quality issues completely

eliminated. This combined solution involved new LunaCoat backing roll covers with improved thermodynamics and mechanical properties, in addition to detailed mechanical service on the existing backing roll for improved dynamic behavior.

The LunaCoat series consists of a well-balanced mix of high-value fibers and functional fillers (Fig. 2). This provides excellent impact resistance, mechanical strength, wear resistance and improved thermodynamic properties.

The scope of mechanical service work included several improvements, e.g. correction of shell thickness variation, evaluation of dynamic conditions of bearings and housings, as well as examination and correction of roundness/concentricity of the roll. One of the tools utilized was a

balancing device (Fig. 1) to improve balance quality, particularly at the center of the roll where the coat weight variation showed the highest amplitude.

Improved paper quality

After implementing this combined solution the MD coat weight variation improved by 60% in the center and by 40% at the edges (Figs. 3 & 4). This led to improved paper quality and thus the printability issues were resolved.

Additional benefits were more stable web tension control, improved calendering operation based on less coat weight/caliper variability, and enhanced CD coat weight profiles.

>>> Customer information:

- Paper grade: coated mechanical grades
- Coater: two short dwell blade coaters on-line
- Speed: 1,500 m/min
- Width: 7.5 m

On Focus: Combination mechanical rolls service and Luna roll covers

| | |
|----------------|---------|
| ProEnvironment | + □ □ □ |
| ProRunability | + + □ □ |
| ProQuality | + + + + |

Section: Coating
Paper Grade: Coated graphic paper

Contact



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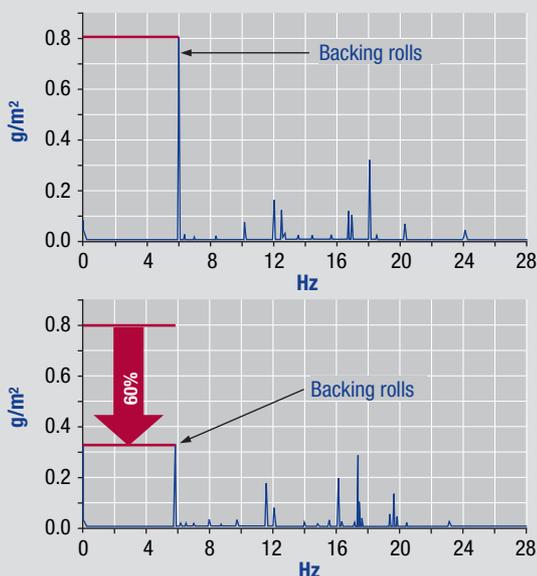


Fig. 3: The combined solution for coating – utilization of Luna covers and mechanical roll service – reduced coat weight variations by 60%.

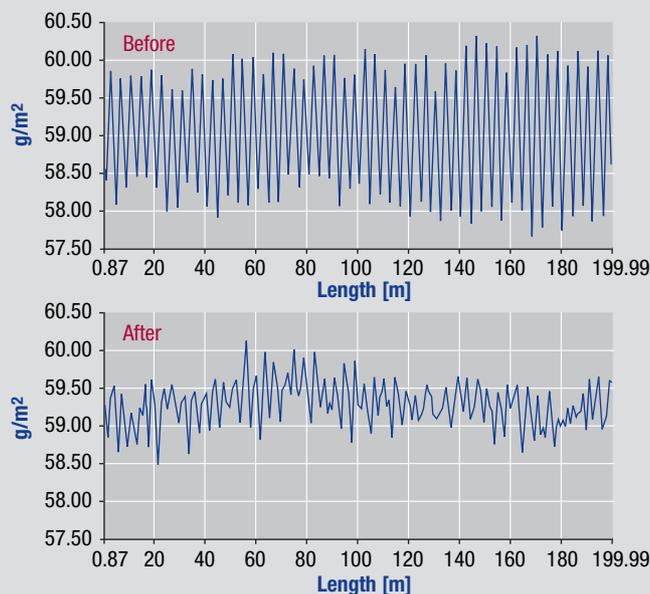


Fig. 4: TAPIO Time Signal plot showing significant improvement on total basis weight variation.

Modern Karton relies on close partnership

Clothing, rolls and service from a single supplier

The Turkish paper manufacturer >>> **Modern Karton** plans to further increase the speed, and thus the productivity of its PM 3 and PM 4. In order to achieve these goals, one of the largest manufacturers of board and packaging paper in Europe relies on expertise from Voith Paper for clothing, rolls and service – all from a single supplier. Together caught up with Şirzat Açıkgöz, Operations Manager Production at Modern Karton in Corlu, Turkey.

“With optimized abrasion and wear resistance we will be able to extend running times.”

Şirzat Açıkgöz



Şirzat Açıkgöz, Operations Manager Production at Modern Karton (left side) in an interview with Bulent Sendag, Voith Paper, Turkey (right side).

twogether: What are the products from Voith Paper you have used so far, and what were the results?

Şirzat Açıkgöz: We are currently working on several projects to increase the potential of both machines. At all positions of the PM 4 forming section, SSB forming fabrics from Voith are used. Here, we achieve very good results with regard to runability and service life. In the press sections of the PM 3 and PM 4, we use the MultiFlex V3 press felt at most positions. We have achieved very good results with this design with regard to stability and conditioning. And, lastly, Voith fabrics are also used in the dryer section – mostly MultiTech LBR spiral fabrics and MultiTech S3.

twogether: How do you intend to increase the machines' speed even further?

Şirzat Açıkgöz: The installation of a central press roll with the TerraSpeed thermo-coated roll cover should lead to better sheet release and lower draw. With optimized abrasion and wear resistance we will be able to extend running times.

twogether: How can Voith Paper help you to achieve this?

Şirzat Açıkgöz: Voith Paper assists us time and again in finding solutions, with products perfectly aligned to each other, experienced specialists and comprehensive service. This means we can continuously increase the production performance of our machines. That's just the sort of partner we need for our projects: a single supplier who understands the complete picture for each project. We are confident that we will achieve a lot together in the future.

>>> Info: Modern Karton

The Turkish company Modern Karton is one of the largest board and packaging paper manufacturers in Europe. Each year, 700,000 t packaging paper are produced both for the domestic market and export markets at the Corlu location, 120 km west of Istanbul. This represents approximately 50% of the Turkish production capacity.

Modern Karton is part of Turkey's Eren Group. The company acquired its first paper machine in 1981. The PM 2 followed 10 years later. The PM 3 was the first Voith machine, added in 2001, followed by the PM 4, which started operation in April 2008. With a width of 8.6 m, the machine produces testliner grades from 100% recovered paper at 1,500 m/min, with an annual production capacity of 400,000 t.

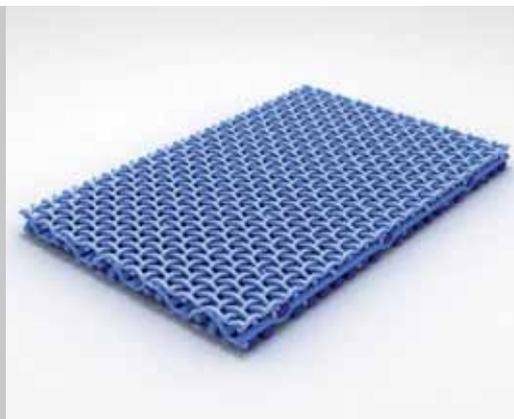
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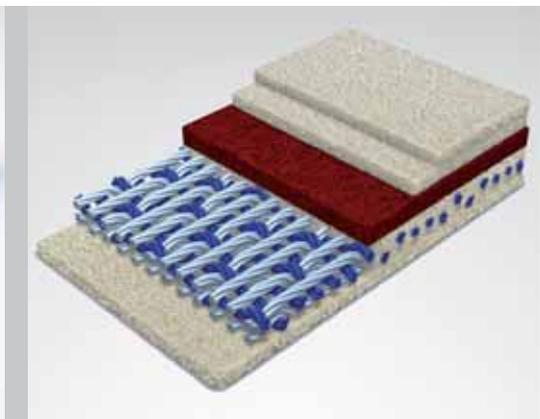
Thomas Jäger
thomas.jaeger@voith.com

“Voith Paper assists us time and again in finding solutions, with products perfectly aligned to each other, experienced specialists and comprehensive service.”

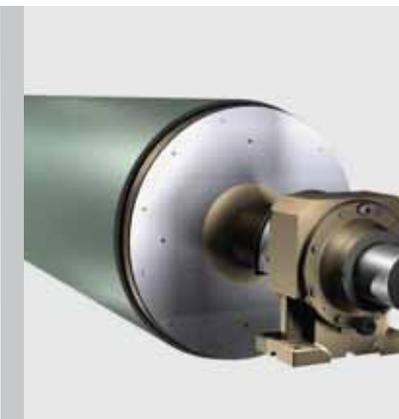
Şirzat Açıkgöz



MultiForm forming fabric.



MultiFlex press felt.



TerraSpeed roll.



Fig. 1: 3-D model of the DeaerationFoamPump 4000.

New development in deinking flotation lowers investment costs

Foam tanks are no longer required due to deaeration pump

With the new DeaerationFoamPump (DFP) 4000 from Voith Paper, noticeably less space is required for foam deaeration in the flotation. Previously, the foam tanks in which the foam is deaerated had to stand alone and tended to overflow. The flotation cells also had to be set up on a higher level. These disadvantages are now a thing of the past with the new foam deaeration pump.

Having a foam tank for primary flotation as well as a foam tank for secondary flotation, including stirring units, is now becoming superfluous thanks to the DFP 4000. The deaeration results are very impressive: The air content of the foam mass is reduced when passing through the pump from 80% to an average of 8%. Conventional deaeration systems offer approximately 12%. In addition, by using the DFP 4000, upstream foam destroyers, downstream long piping as well as pumps with high head pressures to overcome the floor height can be dispensed.

With the DFP 4000, it is possible to deaerate and convey the foam, which is loaded with inks and other impurities, within a single machine (Fig. 3).

As a compact unit, it fully replaces the foam destroyer, foam tank stirring unit and pump of previous deaeration systems (Fig. 4). This means a clear reduction in investment costs for the tank, stirring unit, pipes, pumps and floor space.

How the DFP 4000 works

The foam is conveyed from above into the pump and pre-deaerated by a mechanical foam destroyer. In the lower part, a quick rotational movement is generated whose centrifugal forces bring about a subsequent deaeration. The low-air suspension that is generated is brought to the required pressure so the deaerated foam can be conveyed

out of the machine and into the subsequent process stage (Fig. 2).

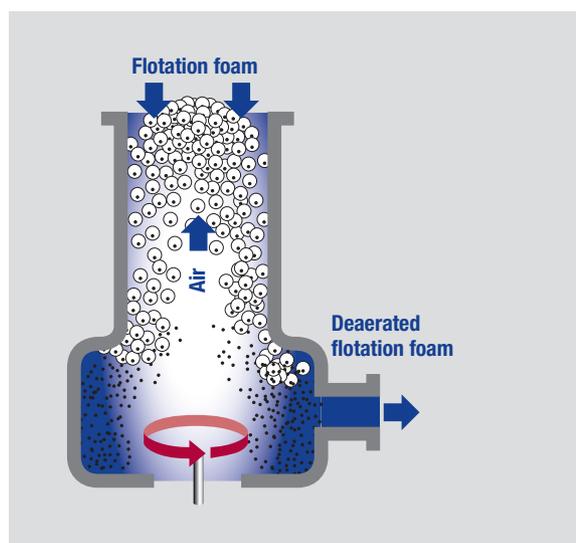


Fig. 2: Principle of the DeaerationFoamPump 4000.

The released air is conveyed out of the machine on the side through a special air chamber so it does not obstruct the foam entering from above.

The new deaeration pump in practice

The first DFP 4000 installed at a customer site in September 2009 has been operating successfully; other DFPs have since been sold in Europe, America and Asia. Examinations of the primary foam from the pre-flotation show that the deaeration principle performs outstandingly. The DFP 4000 achieves better deaeration of the foam than conventional systems.

Due to the success of this new development, Voith Paper has changed its standard for flotation systems and in the future will use the DFP 4000 for which a patent application has been filed.

>>> Operating data:

| | |
|--------------------|----------------|
| Inlet air content | up to 80% |
| Accept air content | 6-14% |
| Flow quantity | 0-6,000 l/min* |
| Pressure head | 2-6 m* |
| Power input | 20-60 kW* |

(*adapted depending on set-up and requirement)

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Foam deaeration in previous systems

Flotation as a deinking mechanism is a proven procedure in which air is introduced into the recovered paper suspension. The ink particles and other impurities that are to be removed, attach to the air bubbles and are extracted through the foam from the suspension of recovered paper. The foam with the dirt particles is subsequently fed to deaeration.

How does deaeration work?

In conventional systems, the foam is conveyed out of the deinking machine and into special foam tanks. An upstream mechanical foam destroyer breaks up the foam so that the portion of air upon entry into the foam tank is already reduced. In the tank, the suspension is stirred so that the air can escape more easily. The free ascension of

the air reduces the gas content of the suspension until the foam liquefies and is finally capable of being pumped.

Until now, deaeration tanks always had to be placed underneath the flotation machine and also frequently in the cellar of a facility to ensure a sufficient height difference for the conveyance of foam. In addition, the tanks are open on top and can overflow with excess foam. That is now a thing of the past with the DFP 4000. The new pump can be linked directly to the deinking machine and forms a clean and closed disposal system. Because it can be placed at the same level as the flotation cells, the entire flotation system saves more space than previous systems. A cellar or an additional floor height for the flotation is no longer needed.

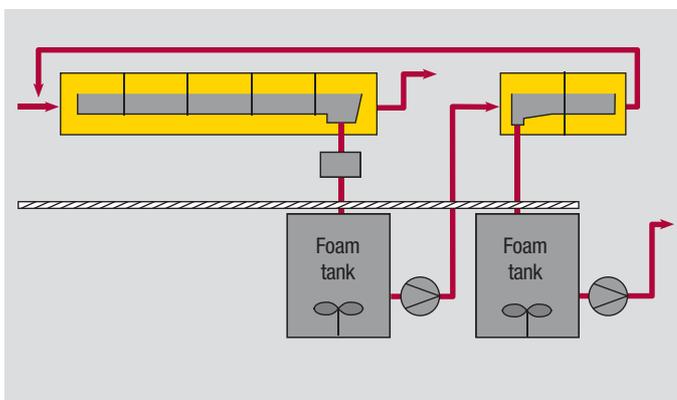


Fig. 3: Structure of a conventional two-stage flotation system.

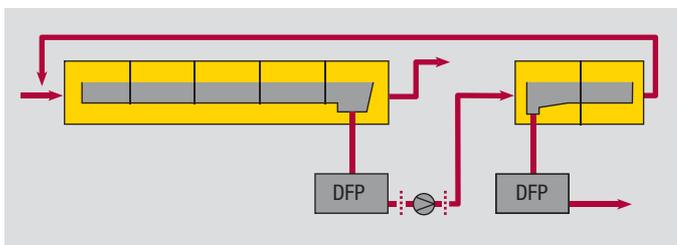


Fig. 4: The new and now highly simplified two-stage flotation system with DFP 4000.



The “steps beyond cfm” concept opens up completely new ground

Higher efficiency through prediction of dewatering performance

For decades, forming fabric permeability has been specified by the air permeability value cfm throughout the whole paper machine clothing sector. This cfm value is firmly established, but nevertheless clearly has limits. Voith Paper has now developed a fundamental concept, which reveals and eliminates the weaknesses of the cfm method. The resulting ability to determine the actual dewatering behavior of forming fabrics is a fundamental innovation in the market.

Permeability is one of the most important properties of forming fabrics. It is directly connected to the dewatering behavior in the first area of the wire section. This initial dewatering affects, among other things, the initial consistency of the fiber mat and thus also the retention, formation, and quality. In this way, the permeability of the forming fabric is a decisive factor for the performance of the paper mill. Therefore, one of the primary goals of Voith Paper is to know, understand, and predict the dewatering behavior of forming fabrics.

Currently, the permeability of a fabric is indicated by its cfm value. This value is determined in a standard measurement procedure, which has not changed in the fabric industry in decades. The fabric is subjected to a specific pressure differential, leading to a stream of air through the sample. The resulting speed of the air stream is measured and then identified as the cfm value. The higher the cfm value, the more open – or permeable – the fabric.

Given the growing complexity of modern fabric designs, the cfm value is becoming increasingly less useful. This standard procedure based on air permeability does continue to provide a rough impression of the dewatering behavior of a forming fabric, but the method also has clear weaknesses. The cfm value is measured by a stream of air, but in the paper mill, water flows through the fabric. Furthermore, there are numerous examples of fabrics that come from different product families and, despite their similar cfm value, demonstrate very different initial dewatering behaviors during use in the paper mill.

New concept gives a deeper insight

Although much research has been done in various directions in recent decades, no satisfactory solution has been found so far. With “steps beyond cfm”, Voith Paper has now developed a fundamental concept that completely explains and eliminates the weaknesses of the

standard cfm method. On the one hand, the concept allows to determine the water flow rate through any fabric. On the other hand, for the first time it is now possible to detect differences in initial dewatering behaviors, even for fabrics with identical cfm values, and to analyze them systematically.

Figure 1 shows the advantage of the “steps beyond cfm” concept based on a flow map. Different areas on the map represent different dewatering behaviors. For the forming fabrics of several SSB product families, the associated flow characteristics were first determined and then marked on the corresponding regions of the map. For comparison, the diagonal lines and the color coding of the background indicate the standard cfm value. Each product family covers a certain cfm range. However, even if various product families partially extend over the same cfm range, their positions on the flow map are

quite different. This demonstrates how much the actual dewatering characteristics of forming fabrics from various product families differ, although they have the same cfm value.

Even smaller deviations in design, for example changes in the weave pattern or the yarn diameter, can significantly influence the water flow rate through a forming fabric. “Steps beyond cfm” uncovers these effects. Additionally, it is now also possible to determine the impact of a change in the water temperature on the initial dewatering.

The “steps beyond cfm” concept relies on the precise interaction of novel measurement techniques, complex simulations, and theoretical fluid mechanics. Therefore, it is based on a solid, very general foundation and is neither limited to woven structures nor to forming fabrics. Rather, it can be used to characterize

the flow behavior of almost all technical textiles.

The new concept is used by Voith Paper not only in research, but it is also applied directly in the development and production sites in Frankenmarkt, Austria, and Shreveport, Louisiana, USA. Among other things, this opens up the possibility of systematically determining the dewatering characteristics of forming fabrics and continuously improving them – from the early development stage to the ultimate fine tuning.

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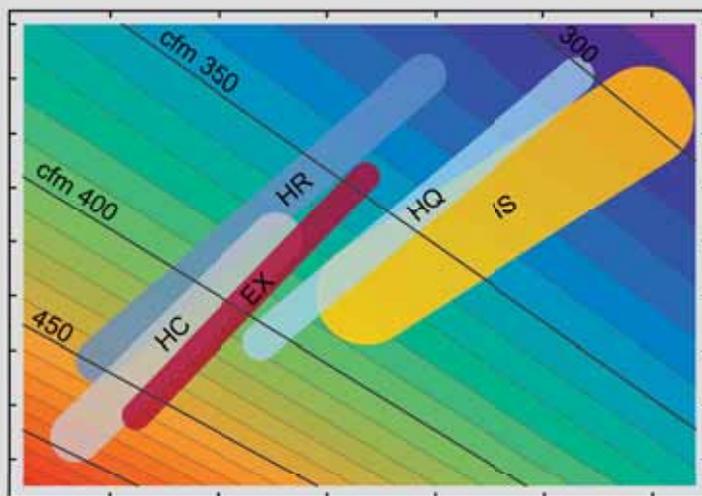


Fig. 1: “Steps beyond cfm” makes it possible to distinguish forming fabrics based on their characteristic dewatering behavior – even for identical cfm values. The flow map illustrates this for several SSB product families.



13 machines in two years speaks for itself

Tissue producers increasingly opting for Voith Paper

One year after the global financial and economic crisis the tissue sector has again reached a respectable growth rate averaging around 4%. Voith Paper alone has sold 13 tissue machines in the last two years. This is predominantly due to technologies such as ATMOS, which enable cost-efficient and environmentally compatible production, but also results from product developments like the NipcoFlex T shoe press.

27.8 million tons of tissue were consumed worldwide in 2008, above all in North America, Europe, China and Latin America. Looking at this figure in a 20 year comparison – in 1988 it was around 13 million tons – one thing in particular stands out: Tissue papers have demonstrated a steady growth rate of more than 4% per annum. After a lower growth last year, the figures expected for 2010 are promising. This is mainly due to

the increasing demand in China and Latin America.

40% of the growth in China

“We assume that the demand for tissue paper will continue to grow in the coming years,” says Rogério Berardi, responsible for sales and marketing for tissue machines at Voith Paper in São Paulo. “Experts forecast for the coming six years an

average growth rate of 3.6%. In China alone tissue consumption will account for 40% of this growth.”

What makes the tissue market so unique for the industry are the very different specifications for the paper from region to region. Marcus Schwier, Vice President Tissue at Voith Paper: “Above all these are differences in the end product itself, e.g. the number of plies, or the

softness of the paper, and in market behavior that varies from country to country. The opinions and wishes of consumers in this regard often diverge widely. In addition, paper manufacturers have to reduce their production costs, and consequently their use of energy and raw materials, in order to stay competitive.”

Progress with ATMOS

Against this background Voith Paper is pursuing a clear strategy: “Voith is focusing on concepts that reduce raw material and energy consumption. We therefore support our customers in operating sustainably. In addition, they also benefit economically, as our solutions offer low total cost of ownership,” explains Schwier. “Innovative concepts such as ATMOS and the NipcoFlex T shoe press have won over our clients and have allowed us to make positive inroads into the premium tissue and dry crepe tissue market in the last three years.”

Until 2007, for example, the manufacture of premium tissue was generally the realm of those producers that had cornered this

market with TAD (through air drying) technology. This is a technology that not only requires a large capital investment but also entails high energy consumption, and thus, high production costs.

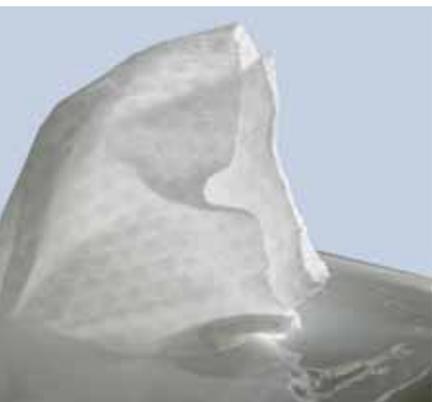
Since then, Voith Paper has successfully countered this technology with its ATMOS technology. “It was developed in the Tissue Process Technology Center at Voith Paper São Paulo. Compared with TAD, the ATMOS technology enables premium tissue to be produced at a 40% lower investment cost, using 60% less energy, fewer fibers and also up to 100% recycled or virgin fibers,” summarizes Berardi.

Nevertheless, this technological progress, which also represents an ecological and economical advance for papermaking, did not just happen by accident. Voith Paper’s pilot machine in São Paulo is of great interest for customers and works on full capacity. The machine can use ATMOS to produce premium tissue but can also manufacture dry crepe conventional tissue. The pilot trials cover the entire tissue process from fiber to finished product.

Investing in research pays off

These kinds of investments are also yielding results for paper manufacturers. For example, Voith Paper won the order to supply a turnkey production line for tissue paper to Bahrain. The client company is a joint venture between the Olayan Group and the Kimberly-Clark Corporation. Other orders come, for example, from Asia Pulp and Paper (APP), YinGe Paper and Hengan Paper, who will commission a total of five Voith tissue machines in China each capable of producing 220 tons daily. In Mexico and Brazil too, a major tissue manufacturer, CMPC Tissue, opted for Voith Paper when ordering two new machines.

ATMOS rebuilds can be done as well. In Chile and North America, customers decided to have rebuilds for their existing machines. “What benefits us significantly in this development is our holistic approach, with which we systematically use the synergies within Voith Paper to the advantage of our customers,” explains Schwier.



Higher tissue production profitability with polyurethane roll covers

SolarSoft increases speed and saves energy

Operational safety, wear resistance, reduced after-hardening, high dry content, press rolls with consistent performance and low energy consumption – all thanks to SolarSoft. The Solar polyurethane technology for roll covers has become the leading product for graphic, board and packaging grades. Compared to conventional rubber roll covers, it offers many benefits to tissue producers.

In 2004, Voith Paper introduced SolarSoft roll cover technology, specifically designed for press rolls and suction press rolls on tissue machines. Since then, this polyurethane cover has been applied many times and is delivering many benefits.

Productivity improvements

SolarSoft increases tissue-making productivity on a number of fronts:

- Exceptional dewatering results in speed increases or reduction of energy consumption
- Consistent nip pressure with no after-hardening of the roll throughout its life
- Constant sheet moisture profile
- Longer grinding intervals and total cover life reduces the machine downtime
- Optimal vibration absorption

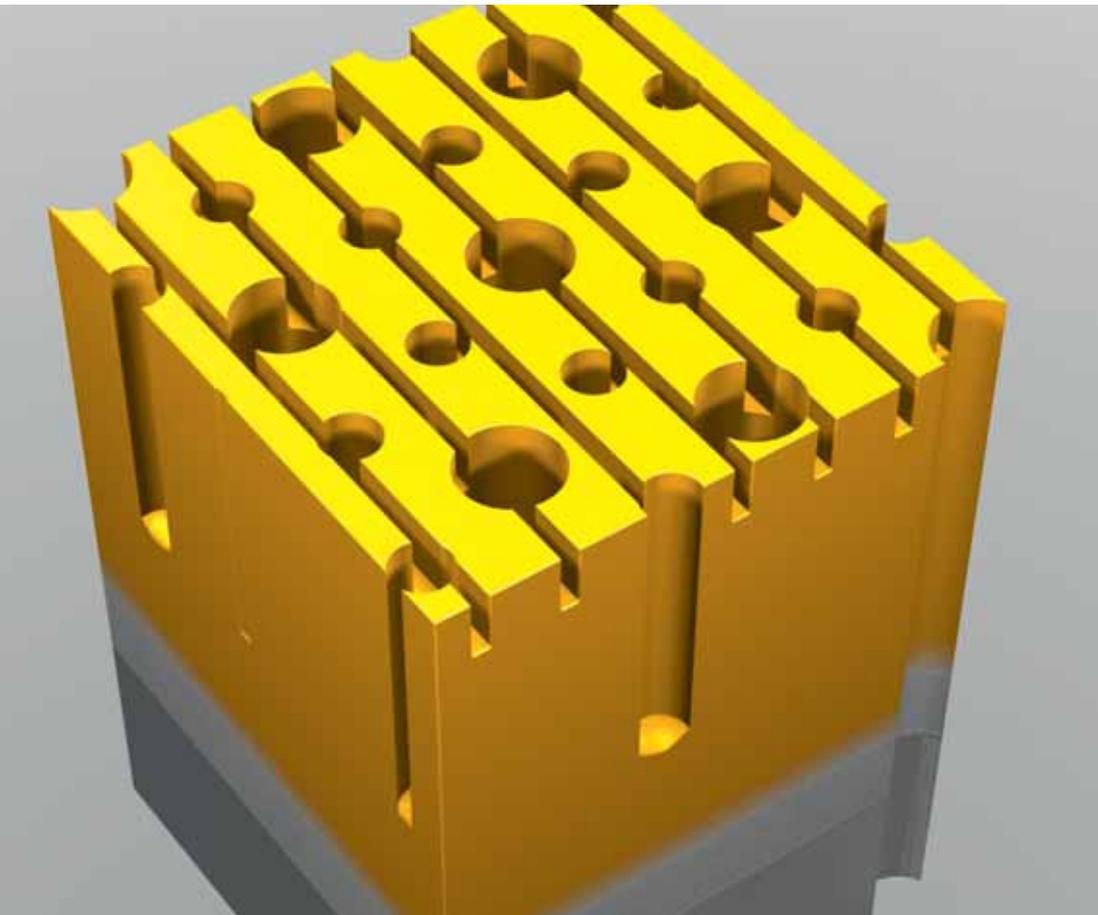


Fig. 1: SolarSoft tissue roll cover.



Fig. 2: WebNet technology.

The SolarSoft technology's steady-state performance maintains the productivity improvement for the life of the roll cover.

Exceptional dewatering

The toughness and hydrolytic stability allow for the configuration of a higher void volume in the nip resulting in improved sheet dewatering capability. The improved strength of the functional layer reduces the level of hole and groove wear yielding a more consistent dewatering over the entire life cycle of the roll.



Quality is one of the key drivers for tissue production. The tailor-made SolarSoft surface designs maintain constant nip conditions during operation, which is essential to maintaining high quality tissue. Due to the fact that polyurethane is not subject to after-hardening, unlike rubber, crushing issues or irregularities in the CD profile are largely eliminated.

Cost savings

Offering longer total cover life, longer running intervals and reduced grind frequency compared to rubber, overall roll cover expenditures are lowered for tissue makers. The advantages of SolarSoft are exponentially increased when including savings from reduced energy consumption as a result of efficient dewatering and drying in the calculation. The sum of these benefits is a lower total cost of ownership with SolarSoft compared to rubber roll covers.

Operational reliability

The cover's bonding to the shell, as well as to the functional layer is a further benefit of the SolarSoft cover. With the WebNet technology developed in 2009, Voith has set a new benchmark. This three-dimensional cross linking enables total bonding strength even under extreme nip conditions (Fig. 2).

The patented bonding system prevents bonding type-specific cover failures. The WebNet technology avoids debonding of the cover, minimizing the operator's operating risk.

SolarSoft performance

The polyurethane functional layer has major benefits compared to rubber covers. The reason for this is the improved key properties for polyurethane. Polyurethane is more resistant to chemical wear and abrasion, providing the highest hardness and surface stability of

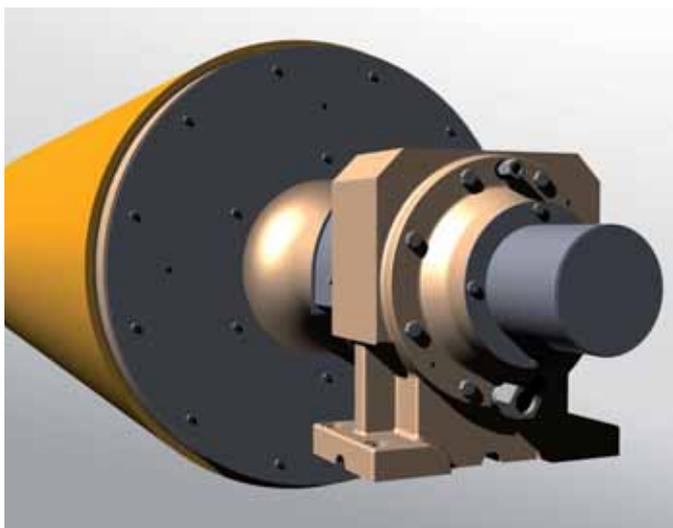


Fig. 3: Tissue pressure roll.

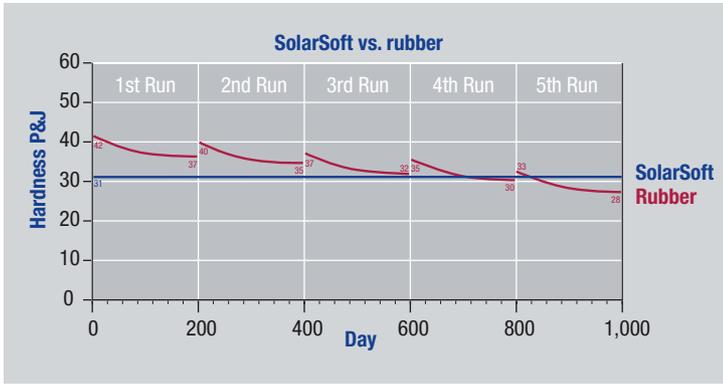


Fig. 4: Comparing the degree of hardness characteristics for rubber and SolarSoft.



Fig. 5: Voith Paper tissue machine.

all roll cover materials. Additionally, its exceptionally low heat generation puts significantly less stress on the bonding layer, while lowering after-hardening effects. This enables maximum machine speed, and also increases felt life and production output.

Polyurethane and rubber have different elasticity properties, therefore they act differently under load. These differences generally require a harder

polyurethane cover to duplicate the nip conditions of an existing rubber cover. SolarSoft polyurethane covers generally soften slightly within the first week and then the hardness stabilizes.

Another key advantage of SolarSoft is its resistance to hardening from oxidative cross linking over time. Rubber covers will often harden at only 20-40% of their life cycle, while polyurethane allows for a consistent nip pressure with no

after-hardening throughout the life cycle of the cover (Fig. 4).

Applications and results

SolarSoft can be used in all tissue applications without any problems:

- Machine speeds up to 2,000 m/min
- Roll diameters up to 1,153 mm
- Roll widths up to 6,000 mm

With more than 60 running positions and 80 deliveries to-date, SolarSoft is providing improvements in cover life, machine speed and product quality (Fig. 6).

Fig. 6: Actual tissue machine results running SolarSoft polyurethane roll covers.

| SolarSoft mill results | |
|---------------------------------------|---|
| Position | Results |
| Suction pressure roll | Improved dryness |
| Suction pressure roll | Improved dryness; life extended from 6 to 8 months |
| Suction pressure roll | Speed increase 45 m/min; life extended from 6 to 14 months |
| Suction pressure roll | Gain of 1% post pressure roll solids |
| Suction pressure roll | Improved drying and higher quality edges; speed increase 30 m/min |
| Suction pressure roll | Speed increase 120 m/min on towel; improved profile |
| Pressure roll | Vibration reduced from 3.6 to 1.7 mm/s |
| Pressure roll | Yankee steam pressure reduced from 7 to 6 bars |
| Pressure roll & suction pressure roll | Grinding interval 12 months instead of 6 with any rubber |

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Mutual trust and cooperation

Smurfit-Stone counts on Total Roll Management

Smurfit-Stone Container Corporation in North America has signed a five-year exclusive agreement with Voith Paper to provide roll covers, roll grinding and roll mechanical services (Total Roll Management). The goal is to significantly decrease the total cost of ownership regarding rolls through increased equipment reliability, improved processes and higher product quality.

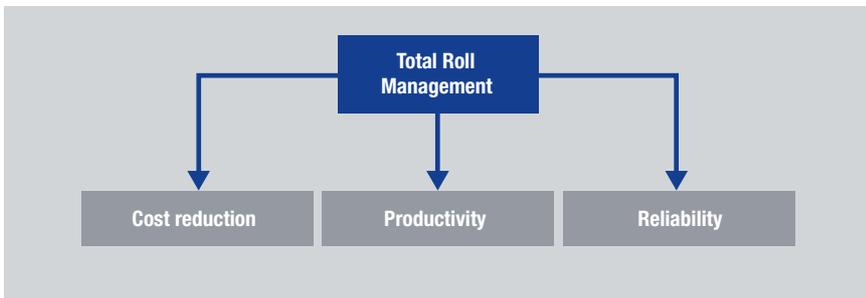


Fig. 1: Voith Paper's Total Roll Management.

Total Roll Management includes:

- Roll covers
- Mechanical roll services
- Roll grinding
- Roll upgrades
- Replacement rolls
- Roll record keeping (SØNAR)
- Roll transportation

Fig. 2: Scope of the TRM program.

In June 2010 Smurfit-Stone started the TRM (Total Roll Management) program at its Hodge, Louisiana (USA) paper mill. Implementation at all sites will be completed by early 2011. The TRM program shows perfectly how to reduce service costs, improve internal

processes, and gain huge steps forward in profitability.

Combining roll service, which includes all mechanical service and roll covers, with Voith Paper's new generation of press fabrics offers further powerful ways to save costs,

increase process stability and product quality.

Successful cooperation

The senior management teams of both companies have made a strong commitment to the program to ensure



"Voith Paper with its Total Roll Management program is the best and most cost-effective partner ..."

David Barnett, Director Reliability Center of Excellence

"In June of this year we entered into a TRM agreement with Voith for all 12 of our mills in the US and Canada. We are not focusing on price, but on the total operating costs. We want to bring them down – for this, Voith Paper with its Total Roll Management program is the best and most cost-effective partner."

its success. Voith's TRM program at >>> Smurfit-Stone is managed by a dedicated strategic account coordinator who is responsible for the implementation, rollout, deliverables and continuous improvement process. Mutually agreed-upon projects have been outlined by machine and mill level personnel and will serve as the foundation for resource and manpower allocation. All roll reliability and machine efficiency initiatives will be monitored and directed by the Smurfit-Stone Operation Excellence team.

Total Roll Management

Voith's Total Roll Management platform focuses on three cornerstones:



Fig. 3: Smurfit-Stone Hodge – TRM team.

- Cost reductions by lowering total operating costs, rather than uncoordinated individual measures
- Productivity measured by machine-specific uptime targets and operational improvements
- Reliability with guaranteed and proven techniques.

Contact



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“Voith’s TRM is a critical piece for our mill division to reach our goal of world-class manufacturing. Beyond the very real improvements we see in roll utilization, our mill teams benefit from learning how to manage through systems, and Voith’s TRM is a world-class system.”

Mike Exner, Senior Vice President and General Manager, Containerboard Mill Division

| Total cost of ownership reductions | Productivity improvements | Reliability improvements |
|---|--|--|
| TRM program commitment value | Improved roll reliability: Increased uptime and production | Reduction/elimination of unscheduled downtime due to roll issues |
| Process optimization and standardization, benchmarking, optimizing products and performance | Optimized roll cover solutions: Increased press solids, improved CD moisture profile, etc. | Increased cycle time between roll servicing |
| Reduction/elimination of internal non-core function costs | Improved quality/performance through sheet consolidation, stability and smoothness | Extended life of wear parts and bearings |
| Reduction/elimination of scheduled & unscheduled roll-related downtime | Optimize press performance with fabric and roll integrated solutions | Preventive maintenance and planned roll changes |
| Reliable, accurate roll records | | Predictable run cycles |
| Increased roll run time cycles | | |
| Increased overall machine efficiency | | |

Fig. 4: Total Roll Management.

Forward-looking service extends running times

Innovative roll maintenance saves money

A continuous improvement process is proving to be successful in extending the functional capability of the roll. As a result, the number of roll changes will be reduced. One German paper mill is profiting from this and has achieved savings of 300,000 euros.

The paper industry suffered severely during the world economic crisis. Maintenance departments were especially hard hit, having to struggle with budget cuts and changes in their personnel structure. This meant that preventive maintenance measures were often reduced. For the most part,

scheduled roll changes often did not take place and the running times of the rolls were stretched beyond their usual capacity.

The result: a decrease in the functionality of the rolls and an increase in unplanned stoppages.

By necessity, even the practice of letting the rolls run until they fail found support again in some paper mills. The costs that arise from roll failure and the unforeseen stoppage of the paper machine associated with it can be extremely high and – depending on machine width, speed and paper grade – can quickly amount to tens of thousands of euros, not to mention the organizational problems and the stress for everyone involved. Admittedly, preventive standard maintenance has its costs too, because rolls or wear-prone parts are frequently replaced when they could have been used a little longer.

>>> Possible monitoring activities:

During machine operation:

- Vibration analysis
- Bearing temperature monitoring
- Infrared analyses of roll components
- Correct settings of load pressures and flow rates
- Temporal course of the vacuum (online measurements in the PCS necessary)
- Dewatering performance (if IDM is available)
- Comparison of PCS indications and actual values
- Leakage spots
- Contamination in the oil system
- Water content analyses in the oil

During machine downtime:

- General inspections of the roll surface
- Appearance/deposits
- Sampling of deposits and later laboratory analysis
- Roughness measurements
- Measurement of surface tensions
- Hardness measurements
- Existing groove depth
- NipSense
- Doctor analyses



Roll test stand with 21 test zones.



Roll service excellence.

The likelihood of failure for technical products is usually shown in a diagram that resembles a bathtub, resulting in the name “bathtub curve.”

Running time until crash

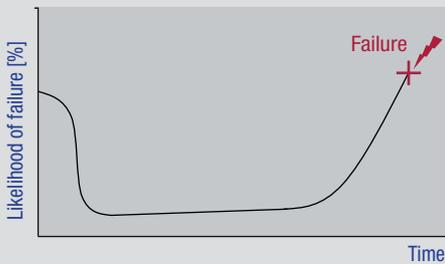


Fig. 1: With this approach, the roll is used in the paper machine until it fails. The result is unplanned downtime for the paper machine.

Preventive roll maintenance

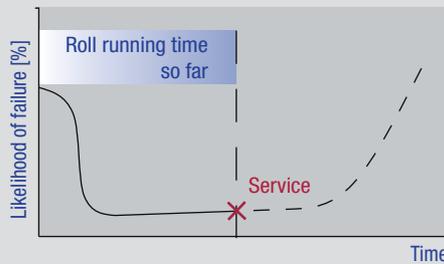


Fig. 2: With the usual preventive maintenance, the roll is dismantled after a specified period and undergoes standard service including preventive replacement of any worn parts.

Innovative roll maintenance

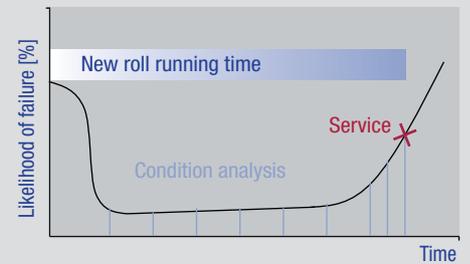


Fig. 3: Voith Paper’s innovative roll maintenance program is based on regular condition analyses of the roll in the machine, which regularly determine the roll’s continued usability. The outcome: longer running times without the risk of a roll crash.



Limitless: in all dimensions, all roll types and all service work.

Analyzing weak spots in a targeted fashion

This is where Voith Paper comes in, with innovative roll maintenance to tackle this difficult area. Through detailed and systematic condition analysis during the service, the rolls and their wear-prone parts are thoroughly examined and possible weak spots are identified. The aim is to find the reasons for the weak spots and to initiate the right countermeasures. The precondition for this is that the history of the roll is known, regardless of whether it is a suction roll, deflection compensation roll, spreader roll or rigid roll. Together with precise inspection at a service center, this is the foundation for competent weak spot analysis.

Working with Voith Paper to target optimization measures and

continuously monitor the roll during later operation will extend the roll's running time and give a clear cost reduction. Therefore, for example, in the case of suction press rolls, even running times of 18 months are no longer uncommon. Through innovative roll maintenance and collaboration with Voith Paper, one German paper mill was able to reduce its roll maintenance costs for a paper machine by 300,000 euros within one year. The previous number of annual roll changes was reduced from 59 to 44 in the process. The success of the concept lies in the continuous increase of a roll's safe running time.

No quality whatsoever is lost. Within the framework of this innovative roll maintenance process, all wear-prone parts are also checked along with the roll. Vibrations, temperature and the surface quality influence the running time and functioning of a

roll. Through monitoring, a roll's functional capability and likelihood of failure can be evaluated as illustrated by the so-called "bathtub curve" (cf. Fig. 1 through 3).

On focus: innovative roll maintenance

| | |
|---------------|------|
| ProSafety | ++++ |
| ProRunability | ++++ |
| ProQuality | ++++ |

Section: Total paper machine
Paper grade: All

Contact



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Effective maintenance management with the computerized system from Voith Paper.

Professional maintenance management provided by the system supplier

CMMS – Computerized Maintenance Management Systems

For a long time, maintenance task schedules needed to be developed on the basis of experience over long periods of time. In future, Voith Paper will provide this experience in its computerized maintenance management system (CMMS) already with the delivery of its systems and products. The CMMS thus supports the maintenance management of the paper mill in daily planning, task documentation and cost control. In addition, management of non-repairable components, wear parts and replacement parts is improved.

The professional planning of preventive maintenance is indispensable in ensuring the availability of complex machines, facilities and systems. The goal of higher system availability with simultaneously lower maintenance costs forces maintenance management to constantly optimize maintenance activities. Reliable key performance figures are required for this, which make the costs as well as benefits of maintenance measures transparent and comprehensible

over longer periods. Computerized systems offer an enormous advantage here.

Like any CMMS software, Voith Paper's solution also manages all the system maintenance-related information in a database. The software preferred by the customer or already present in the paper mill, such as SAP or Maximo, is used for embedding data, instructions and queries. If no adaptable program is

available, Voith Paper can of course also supply the software platform. The CMMS manages inspection and preventive maintenance instructions in an object-related fashion. For this, all relevant areas of maintenance in the plant are broken down into so-called "technical objects." A typical paper mill can easily have more than 60,000 technical objects with clear instructions for preventive maintenance.

Quick access to important information

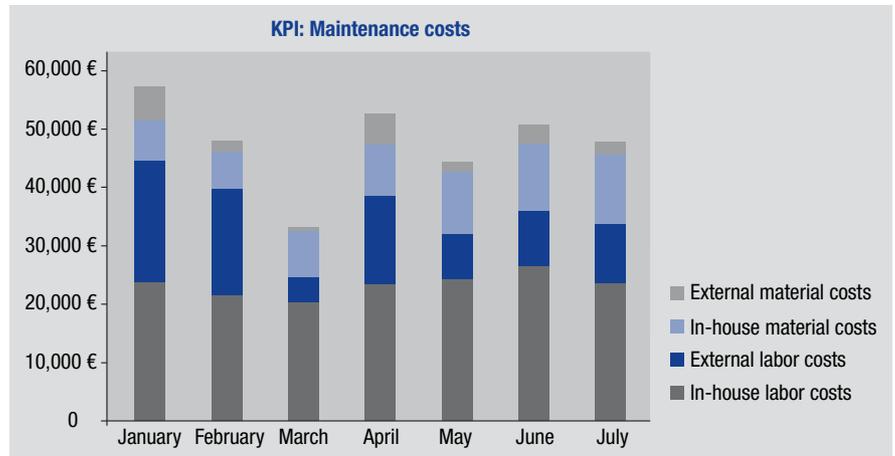
The technical object that is relevant for maintenance is also linked to the system and device data, usually only available in handbooks or in warranty information sheets. The description of the associated maintenance activities includes comprehensive information on:

- Necessary inspection tasks and preventive maintenance actions
- Recommended inspection intervals
- Required time for task performance
- Recommended qualification of executing employee(s)
- Required demand of expendable materials and wear parts

Drawing up maintenance plans and issuing maintenance work orders to the maintenance personnel is likewise done with this kind of management system. Also the contribution of the paper-producing personnel in the mill is used in the consistent implementation of “total productive maintenance” principles. That makes all activities and the tracking of maintenance costs for each relevant technical object transparent and easy to understand. Activity reports are stored in the CMMS in a structured way. Thus, the management is able to set up queries throughout the history of a technical object in a targeted fashion. The result reveals causes behind decreasing performances, and even sneaking deterioration of individual technical objects can get detected.

Effective spare and wear part inventory management

Since maintenance-related material consumptions will be tracked in a



Makes decisions easier: the clearly presentation of maintenance costs in the form of key performance indicators (KPIs).

professional manner from the very beginning, replacement part availability can be managed more effectively. Through connection of the CMMS to the inventory and materials management system of the paper mill, the customer profits from improved management of expandable materials, wear and spare parts. All relevant maintenance activities as well as their resulting costs are routinely analyzed and presented as key performance indicators (KPIs). These key performance indicators form the basis for improved management of paper mills' system availability and life cycle cost.

Mobile data recording directly at the machine

For the most efficient communication possible with the maintenance personnel (e.g. service mechanics, electricians, C&I specialists), the Voith Paper system has the so-called “Mobility4Maintenance” option. With the aid of mobile recording devices and RFID (radio frequency identification) technology, the CMMS can be accessed directly at the machine and inspection and maintenance orders can be recorded on site. This reduces

both the work required and the sources of errors. In this case Voith Paper takes over preparation and integration of data in the CMMS.

The tailor-made solutions are developed in a collaborative effort by the experienced experts, product managers, designers and maintenance experts of Voith Paper and Voith Industrial Services. The collaboration of system engineers and industrial service providers offers the paper industry new opportunities for more efficient maintenance concepts. Voith Paper can deliver CMMS solutions as part of a new machine or new system deliveries or as an on-demand service for an existing plant. In cases of subsequent installation or optimization of an existing CMMS, the baseline for improvement measures are determined by a maintenance audit performed at the beginning of the project.

Contact



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High-caliber speakers at panel discussion in Heidenheim

“Paper is a medium with a future”

On the panel: five distinguished, highly skilled professionals with five different points of view. Yet in the end, the consensus was: “Paper is a medium with a future.” The panel discussion hosted by Voith Paper in Heidenheim was entertaining, enjoyable and provided a forecast of upcoming years.

A quick glance at the podium was enough to indicate a very exciting evening event to come at the packed Heidenheim Congress Center. This is where Voith Paper president Dr. Hans-Peter Sollinger took his place alongside Greenpeace Germany campaign manager Dr. Thomas Henningsen to discuss the future of paper. And right away, the two embarked on the first dialogue of the evening – about the endeavors and successes of the paper industry in using increasingly less virgin fiber for paper production.

Responsible use of resources

“The question in the future will be: Despite increasing demand for paper in countries such as India and China, how do we deal responsibly with the

resources of energy, water and fibers?” said Dr. Sollinger. In his view, for example, part of this process is using even more recovered paper for new paper products. And the Greenpeace manager agreed that a higher recycling quota was exactly what he continues to demand. “More recycling and less paper consumption – that is the solution for ecologically responsible conduct in the paper industry.”

“But aren’t we already using less and less paper thanks to the Internet, etc?” asked Angela Elis, German TV editor, author and panel facilitator. The answer to this question was provided by Thomas Brackvogel, Managing Director of the Neue Pressegesellschaft publishing company located in southern Germany. “On the contrary, in our editorial offices we still use and

print at least as much paper as before the growth of electronic media.” He had been listening closely to Dr. Sollinger’s opening speech and was surprised by one thing above all: the rise in demand for tissue paper. However, tongue-in-cheek, he right away provided his own explanation: “Perhaps the global financial situation is bringing more tears to our eyes that then need to be wiped dry with something soft and fluffy.”

Increasing demand for packaging material

Returning to the serious issue of the future of paper, the discussion then turned to the significance of printed information in the form of daily and weekly newspapers, magazines and trade journals. “Naturally these media

TV editor Angela Elis led a lively discussion.

Dr. Michael Knoche, Director of the famous Herzogin-Anna-Amalia-Library in Weimar.

Sebastian Moleski, President of Wikimedia Germany.



continue to have their place, but I don't see them having much of a future," interjected Sebastian Moleski. He was on the panel as president of Wikimedia Germany, whose best-known project is the online encyclopedia Wikipedia.

Just take the example of the Brockhaus encyclopedia. In a direct comparison the currency of the entries in Wikipedia – which incidentally is used by journalists worldwide as a research tool – could not be bettered or replaced by the printed book. "We also shouldn't forget that in one way electronic media even increases paper consumption, namely for packaging material." Those ordering from the Internet want to have their goods delivered well packaged. Board continues to be the packaging material of choice.

Preserve the book as a cultural asset

Dr. Michael Knoche offered quite a different perspective on the significance of paper. The Director of the Herzogin-Anna-Amalia-Library



Five panelists, five points of view, one consensus.

in Weimar, Germany, which was founded in 1691, made the point yet again that paper, in the form of books, is an important cultural asset that needs to be preserved and cultivated. "For centuries, knowledge has been imparted through books, and I am convinced that this will remain the case in the future, too. What about the school textbook or the children's book? Do you really want to read a bedtime story from an iPad?"

Admittedly, he added, there is no doubt that certain types of publications will disappear in the relentless trend towards using electronic media. "However, the figures from the Frankfurt Book Fair,

for example, where around 300,000 new releases were showcased, speak for themselves, even if individual print run sizes are on the decline. Ambitious, well-written literature will always be read in book form."

Regardless of whether the works of the great philosophers are read in digital or printed form, or we actually need around 350 different daily newspapers in Germany alone, or paper consumption will actually rise as drastically as expected in the next 20 years – "Paper will always have a certain value and importance in society." These were Dr. Sollinger's concluding remarks, which got to the heart of the matter.

Thomas Brackvogel, Managing Director of a German publishing company.



Dr. Thomas Henningsen, Greenpeace Germany campaign manager.



Dr. Hans-Peter Sollinger, President Voith Paper.



Voith Turbo's hybrid gear saves fuel

Eco-friendly drive alternative for public transit buses

Since the summer of 2010, 22 buses have been driving with the diesel-electric and eco-friendly drive system DIWAhybrid. At a U.S. bus manufacturer, the DIWAhybrid transmission has been successfully tested and brought into action. Fuel consumption has been reduced up to 15%, depending on the route.

The DIWAhybrid is a further development of the proven DIWA transmission and presents a genuine alternative over conventional drives with combustion engines in terms of economy and emissions. Simulations and actual measurements have shown fuel saving potentials up to 20%. These are accompanied by a corresponding reduction of CO₂ emissions.

In the DIWAhybrid, an asynchronous electric motor complements the diesel

engine when the vehicle is starting and accelerating. During the brake application, the asynchronous machine serves as a generator and acts as a primary retarder that optimally supplements the DIWA secondary retarder. This protects the service brake, reduces brake wear and minimizes fine dust pollution.

Several bus manufacturers, who were looking for an

innovative drive solution, are already convinced by the DIWAhybrid-system and have these gears in use.



First, the machine, which had been in service for decades at an automotive supplier's factory, is collected and completely dismantled. It is found that

Overhaul for machine tools with Voith Industrial Services

Turning old into new after 31 years

Machine tools enjoy a long service life. The machines are made as good as new in a general overhaul. The retro-fit specialists at Voith Industrial Services have returned the shine to a 31-year-old drilling machine.

the guides and clamps are defective and the electrics are faulty. Several wearing parts need to be replaced.

Site manager Michael Maier, with ten years of experience in retro-fits behind him, has exact knowledge of every individual volume of the machine tools. "Once reconditioned, many of the machines built in the 1970s can do another 30 years in service," explained Maier.

"After 60 years a drilling machine might be allowed to retire."

On the reconditioned machine, the enterprise offers a minimum guarantee of one year. "Many workers at our customers' factories prefer to work with the old machines," says Maier. "They are reliable, flexible and easy to operate – ideal for daily use at a production facility."

German Chancellor visits Voith Hydro

Merkel emphasizes the role of hydro power in Germany

At the end of August 2010, Chancellor Angela Merkel visited Voith Hydro in Heidenheim as part of her “energy tour.” In the company’s “Brunnenmühle” research and development center, she learned about the current state of the art in hydroelectric power technology.

Voith used the visit to illustrate the dual relevance of hydroelectric power. It is an indispensable technology for renewable energy generation and an important storage technology for energy, which contributes to maintaining the stability of the electricity transmission networks and therefore the power supply. After her visit to Heidenheim, the Chancellor summed up the positive impression she had formed of Voith: “Now I know that hydro power in Germany is in good hands.”

Hydro power is the most important source of all renewable energy. Worldwide, around 80% of renewable energy comes from hydroelectric power. A quarter of the electricity generated by hydroelectric power is produced with generators and turbines from Voith Hydro.

The role of pumped storage plants is rising in importance in the mix as electricity generation increasingly turns to renewable energy sources. With them, an oversupply of electricity, at night for example, can be used to pump water from a lower to a higher reservoir. At a later time – during peak loads or periods of lower wind and sunlight – a pumped storage plant can provide electricity in just a few minutes. This allows for an economical use of renewable energies.

Even in Germany, there is still room for the expansion of hydro power, especially through the modernization of existing facilities. A good example of this is the Rheinfelden hydro power plant on the German-Swiss border, which Angela Merkel visited just a few hours before her visit to Heidenheim. It is equipped with four Kaplan bulb turbines by Voith Hydro. The power plant provides clean electricity for about 200,000 households and allows for savings of approximately 300,000 tons of carbon dioxide annually.

Wind needs water, solar needs water.



German Chancellor Merkel visits the Voith Hydro Brunnenmühle laboratory in Heidenheim.

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