

# impressive

ISSUE 3/2018

## Looking at the inside

Heimbach forming fabrics – more than meets the eye

## Consistently good for every grade

Atrojet continues to impress

## Pockets full of air?

Paper Pete – small steps for better drying

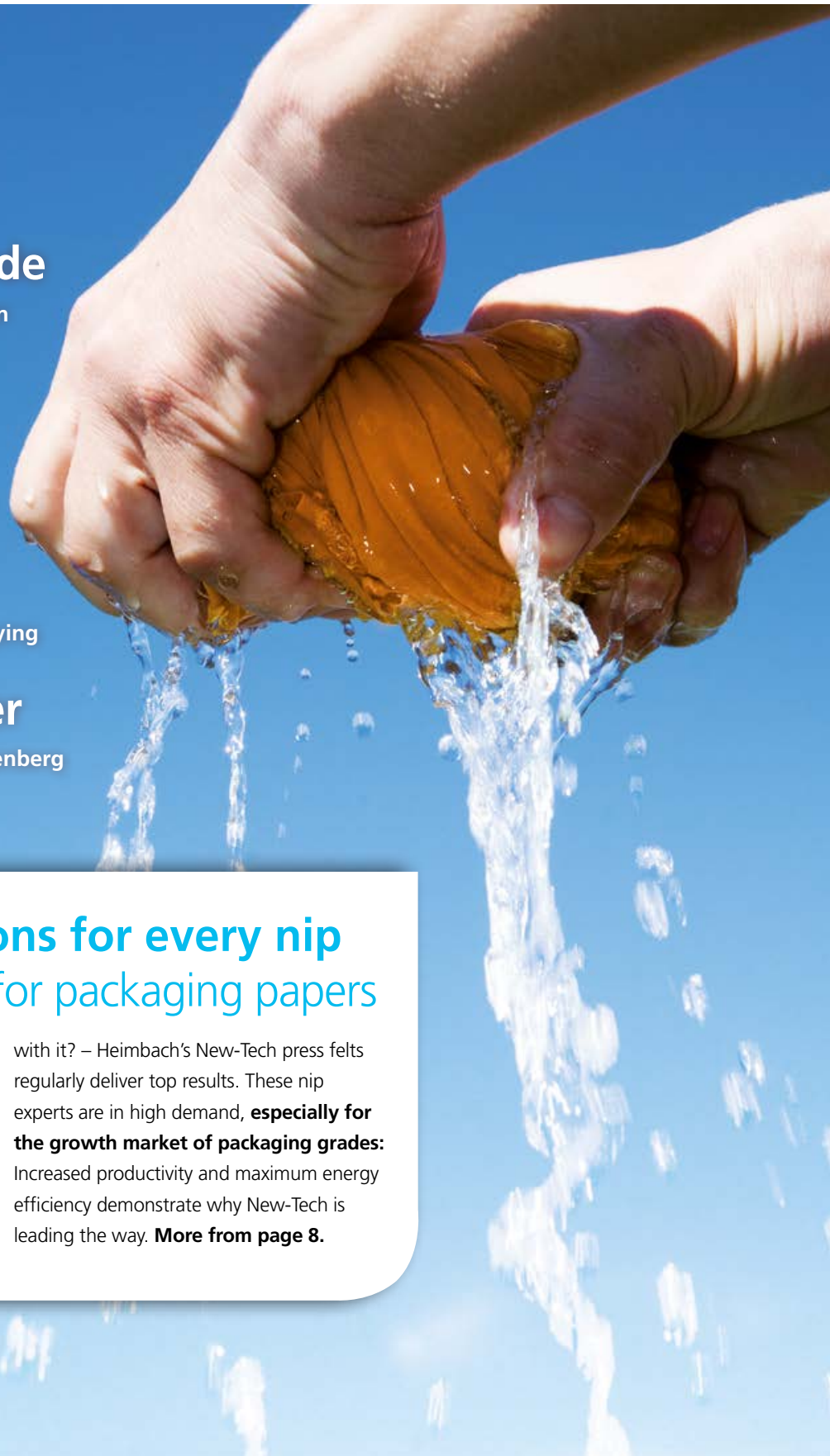
## A man like no other

“Media revolutionary” Johannes Gutenberg

## Tailor-made solutions for every nip New-Tech press felts for packaging papers

More and more producers of packaging solutions and cartonboard are committing to nip dewatering: **The most efficient way to obtain the highest possible dry content after the press section.** But what good is the most modern dewatering technology if clothing does not keep pace

with it? – Heimbach’s New-Tech press felts regularly deliver top results. These nip experts are in high demand, **especially for the growth market of packaging grades:** Increased productivity and maximum energy efficiency demonstrate why New-Tech is leading the way. **More from page 8.**



Dear customers,



A beautiful summer lies behind us and many football fans spent part of their holidays watching thrilling games at the World Championships. We, too, were in the grip of football fever: Whether keeping our fingers crossed for a particular team or involvement with the popular **Heimbach World Cup prediction game**, whose winners will be announced here. It was a tight result, this much I can already say.

When it comes to dewatering with **New-Technology press felts**, however, there is no tight result: Read more on this type of clothing that delivers optimum value for papermakers whose focus is on **dry content after the press section**.

Our colleague **Paper Pete** also concentrates on drying in today's report: Put more precisely, he demonstrates opportunities for you to optimise pocket ventilation on your paper machine. **Energy savings and increased economic efficiency** are just two aspects that make a closer look worthwhile.

Heimbach's engineers also provide a detailed insight by presenting the **benefits of tailor-made forming fabrics** – from the inside out! Because taking only a superficial look at this kind of clothing falls short of the mark. The most important point is not always the most obvious one: This applies particularly to the "multi-talented" Primoselect, which provides a **huge amount of freedom of choice in terms of design**.

To offer you outstanding products has always been our aim and ambition – you could call it a matter that's close to our hearts. In the same way this applies to the **"Man of the Millennium", Johannes Gutenberg**, whose invention marked the beginning of modern printing: The printed word has helped make **paper into the no.1 cultural medium** – connecting tradition to the modern age.

With this in mind we will also continue to distribute a printed impressive in the future! With best wishes for continued success in your daily work.

Peter Michels

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## Data Protection

### Your data in safe hands

*At the end of May the General Data Protection Regulation (GDPR) came into effect. It transfers EU regulations relating to the security of personal data into national law. Despite having different names within the membership of the EU, it is nevertheless an EU-wide regulation covering all businesses within its jurisdiction.*

Of course, this also applies to Heimbach! We only use your personal data, dear reader, to **enable us to deliver your edition of impressive on a regular basis**. We assure you that over and above this we will never share your data with third parties.

#### **A promise that can be relied on**

Your name and company address are filed in our central system, which is **regularly administered and maintained**. With each edition of impressive it is our aim to provide you with facts and information from our area of common activity that is both newsworthy and interesting. If, however, you no longer wish to continue receiving our customer magazine we will of course respect your request and remove you from our mailing list: A short message to our email address [info@heimbach.com](mailto:info@heimbach.com), including your contact details and the reference "unsubscribe from impressive", is sufficient. Of course we would much rather **continue to count you among our loyal readers** and would like to take this opportunity to thank you for your continued interest.



In Profile



## He knows the whole country

### Łukasz Kaniecki looks after Poland

*Papermakers require complex knowledge from a variety of fields. Preferably, of course, in their mother tongue and provided on the spot. This applies perfectly to Łukasz Kaniecki, who we are pleased to welcome as a service engineer in our team: He has been representing Heimbach in Poland for almost one year, and takes care of customers' technical service needs with the application of detailed know-how.*

The expert in chemical additives began his career with Heimbach in September 2017. Customers all the way from Gdansk to Krakow benefit from his long-term experience with their machines.

#### **Past connections matter**

After studying paper technology at Lodz Technical University, the father of two daughters worked for eleven years at a chemical company supplying the paper industry:

**"I know more or less every paper machine in Poland, no matter what type"**, says Kaniecki, now focused on machine clothing in his capacity as sales and service engineer. A new field of activity – old connections: country-wide, familiar with the industry, reliable.

#### **Comprehensive Understanding**

As the 'passionate advisor' says, what counts in customer service is the interaction of many different perspectives: **"Machine clothing and chemical additives, in particular, must perform well together"**, states the family man, who enjoys travelling and living an active life. He lists various ball sports, Motocross and outdoor activities as his favourite hobbies: "My big motivation is to become an Ironman one day, perhaps even on Hawaii", confirmed our new colleague. **A remarkable focus** – just as he applies himself in practice, enabling customers on-site to produce the best paper.

## Primoselect

- Market launch 2012
- For all grades and machines
- 50 Designs available – more possible
- Types: Heavy-Duty, Fine, Superfine

# The difference lies within Forming fabrics – A Papermakers best friend

*There are so many issues for today's papermaker to address and so many factors to consider when making paper that conforms to the requirements of every customer – whilst still running a profitable operation – that it is very easy to forget or disregard the simple forming fabric. Is it just a commodity maybe? Or is it a conveyor that picks up stock from the head box and delivers it into the press section where heavy duty forces come into play to render a fibrous mass more similar to a sheet of paper? Not a bit of it!*

Your forming **fabrics can certainly influence the cost of paper production.**

Not simply at the most basic level whereby consumption equals cost and reduced consumption, due to increased life as a logical cause, leads to lower clothing cost. There are numerous other means by which a forming fabric can have a clear and significant impact on costs.

### Cost and quality benefits

If fibre retention goes up, so **raw material cost can come down. Likewise, the fabric design can influence power consumption** at the wet end, either by means of improved dewatering characteristics or by taking advantage of advances in yarn extrusion and materials technology to reduce friction or water retention in the yarns. At the same time it is clear that in the case of most, if not

all, paper grades some of the required sheet properties – **formation, wire mark, surface characteristics for example – are influenced, and sometimes set, very early on in the consolidation process.** It is certainly true to say that it can be difficult, if not impossible, to fix any defects and deficiencies later on in the process.

### Inside the forming fabric

The best way to understand just how your fabric can provide the results detailed above is actually to take a much deeper look inside a forming fabric. The easiest way to begin is in fact to consider a **modern forming fabric as two separate and individual layers** – each one consisting of machine direction (MD) and cross direction (XD) yarns. So, in this case Fig. 1 highlights the paper side layer with the sheet-supporting elements of this

fabric highlighted in red, whilst in Fig. 2 the machine side layer is highlighted with the yarns that add bulk to the structure and take the impact of contact with the machine and its' abrasion-inducing elements also highlighted in red.

### Size matters

The statement is certainly a truism in the case of forming fabric yarn diameters! Looking more carefully at the paper side "fabric" (Fig. 3), it is clear that small, and potentially extra-small, diameter MD and CD yarns are in use. This means that large numbers of these yarns can be incorporated into the structure with the result that the **distance between support points is reduced to a minimum.** In the first instance, this ensures that significantly fewer fibres pass through the fabric to the potential benefit of sheet

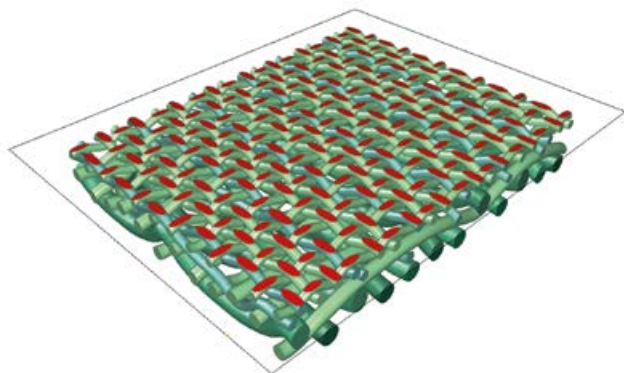


Fig. 1: Primoselect paper side: Sheet supporting elements highlighted

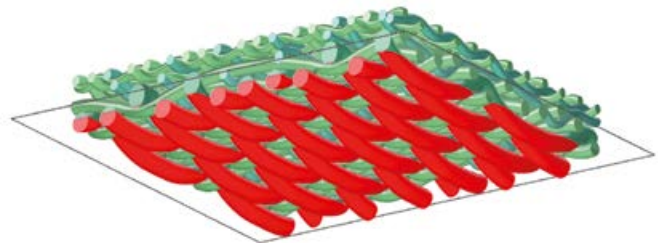


Fig. 2: Primoselect machine side: High abrasion potential

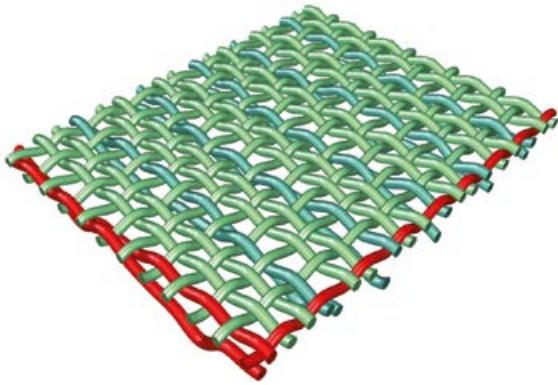


Fig. 3: Paper side layer: Small yarns in both CD and MD

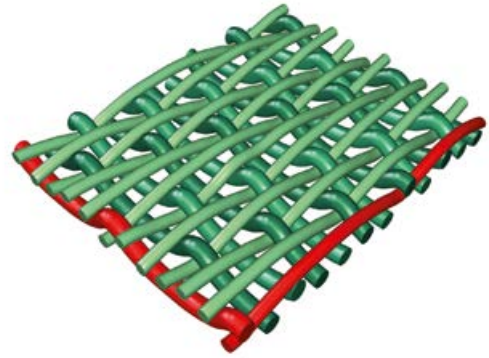


Fig. 4: Machine side: Larger CD yarns for life potential, larger MD yarns for resistance to elongation

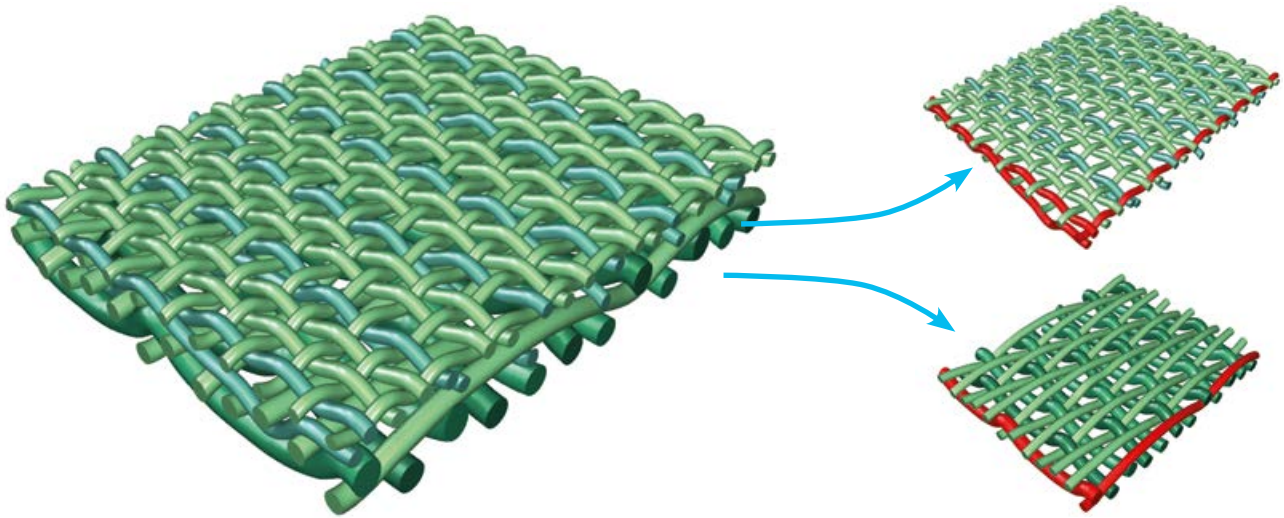


Fig. 5 Two component layers become one forming fabric

formation. Secondly, the plain weave paper side **promotes even and uniform fibre distribution** during the forming process. Thirdly, the small yarn diameters ensure that there are enough highly efficient drainage channels to facilitate quick and easy water removal. Now let us rotate the fabric and focus our attention on the machine side.

#### Stability guaranteed

The machine side “fabric” contains yarns of much larger diameter (Fig. 4). Stable, thicker yarns can certainly pave the way for the **improvement of life potential** via higher resistance to abrasion. They are also more able **to resist the elongation** that can occur as a forming fabric is subjected to the

high braking and release forces that occur during normal operation. Excessive elongation would lead to fabric stretching with the subsequent loss of tension risking higher power consumption. The option to change weave patterns, for example from 5 or 6 shaft up to 10 or 12, is also vital in the machine side “fabric” design to provide even better resistance to abrasion or cross machine direction stability.

#### Binding is the key

Put the two different “fabrics” together (Fig. 5) and we have a forming fabric capable of fulfilling multiple needs that allows fabric designers, product managers and paper manufacturers to **begin building in**

**tailor-made characteristics** that can both save cost and improve paper quality. Now that is the kind of success that wins friends! Every chef would agree that the best recipes always have a **key ingredient that is not always immediately recognisable** or to the fore, but without which the dish just does not work. In a successful and modern forming fabric this **critical ingredient is the binder yarn!** Why? The problem, of course, is that the two layers will also run independently of each other if we are unable **to bind them together in a single structure** that runs as a unified fabric whilst continuing to fulfil multiple tasks. →

## primobond.

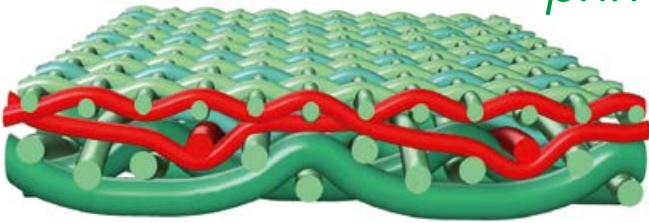


Fig. 6: Primobond with two binder yarns

## primocross.

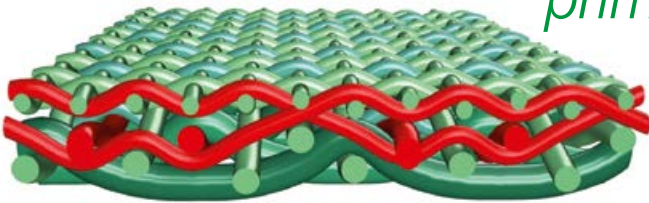


Fig. 7: Primocross with modified binding pattern

## primoselect.

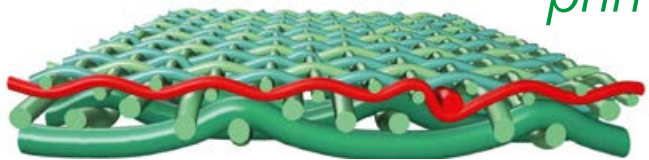


Fig. 8 Primoselect – only one binding yarn

### Primobond – the first SSB design

At Heimbach we offer three product lines that are equipped with different binder yarn concepts. The **Primobond** family is our oldest such design with more than **20 years of sales** and a commensurate high level of application experience and production knowledge. **This design uses a pair of**

**binder yarns** to pull the two fabrics together. At any point in time only one of these yarns is at the surface of the fabric and in contact with the paper sheet. The other yarn is fulfilling the less obvious but nonetheless critical function of holding the two fabrics together (Fig. 6). Unfortunately the use of two binder yarns can reduce dewatering and also could create an air gap between the paper and machine side layers.

### Milestones for Primocross

Bearing this in mind, and as an illustration of the **increasing importance of binder yarn technology**, in 2009 we introduced a new generation of products under the **Primocross** (Fig. 7) brand. This new design employed a new binder concept with the potential to **reduce the amount of internal abrasion** that could occur with other SSB fabrics whilst also **allowing us to reduce caliper**. Although this has opened new opportunities it would be considered as a “tweak” to the recipe as there is still a requirement for a pair of binder yarns of which **only one is necessary for paper-making**. So the forming experts went back to the drawing board. Can we halve the quantity of binder yarns that we need?

### Here comes a step change

**Primoselect**, (Fig. 8) is the result of this extensive development programme. A unique, patented, state-of-the-art forming fabric that has **produced best-in-class results** for more than 4 years now. This design completely reworks the binder concept, **replacing as it does the paired binders with a single yarn**. This subtle but entirely critical change means that the air layer between paper and machine side is now gone, **reducing caliper by 10-20 %** (Fig. 9). Superfluous yarns are now eliminated from the structure with the option of **more drainage, higher fibre support, increased life potential** and more besides. The machine direction yarns **now interlock adjacent to their neighbour** instead of sitting on top of one another as is the case with all other designs.

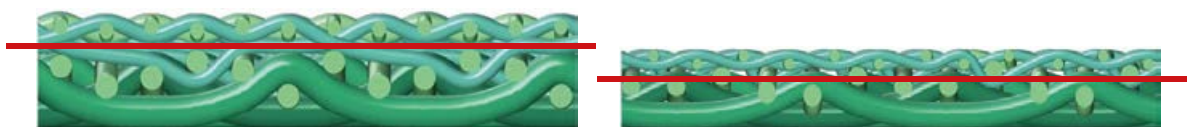


Fig. 9: Primoselect (right) – much lower caliper than SSB designs

## Life Potential vs Formation

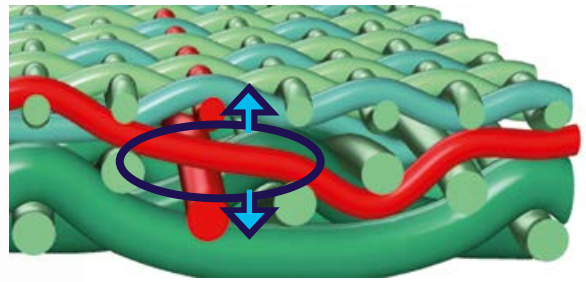
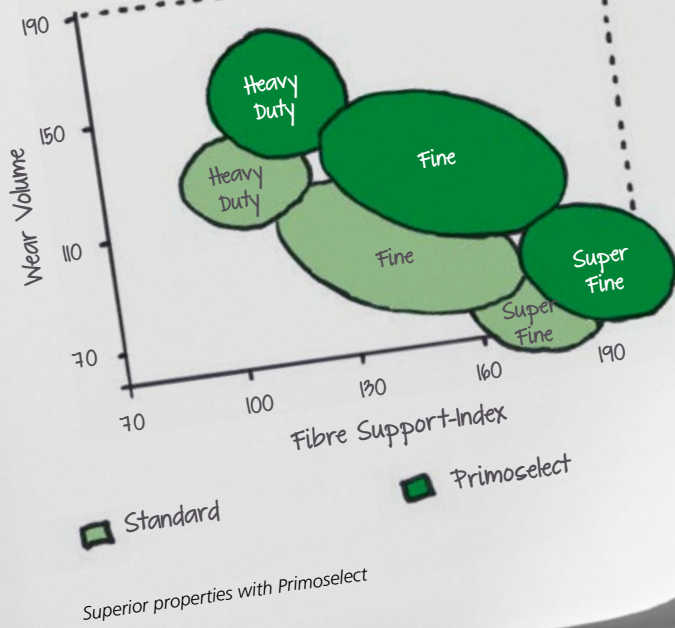


Fig. 10: SSB paired binder yarns separate the two layers

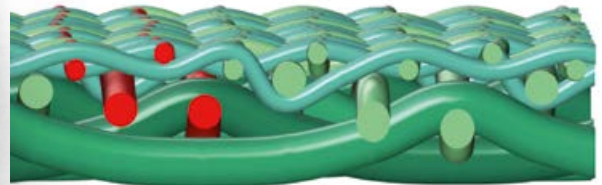


Fig. 11: Primoselect – no separation and offset MD yarns

### Finding the best option together

First and foremost, for papermakers, Primoselect means **unprecedented flexibility**: Thanks to the innovative binder system, optimum dewatering capacity, higher fibre support, reduced energy consumption, higher productivity or longer service life can be **designed according to customer requirements**. As there is only a single binder yarn, paper and machine sides are no longer separated from each other as is the case with SSB fabrics. **Machine direction yarns are also slightly offset**, which fills the centre of the fabric with more material. The result: **lower void volume**.

### New thinking – new possibilities

Why did developers ever come together to

question the binder yarn? There is no doubt that in the past, all developments or upgrades of modern forming fabrics had **focused on the exterior of the product**. The key factor was to seek the **optimum papermaking surface**, the highest fibre support – or the **highest resistance to abrasion**, providing the longest running time, wear volume. There was little appetite for looking inside the structure. At the beginning of the Primoselect development it was relatively new to **focus on the internal core of the forming fabric** rather than its' paper and machine-side surfaces.

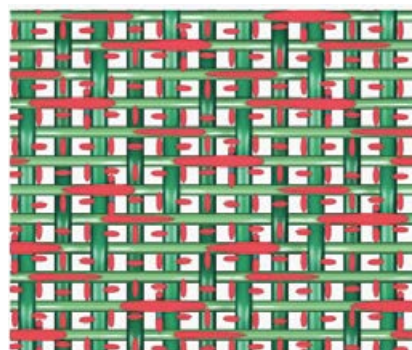
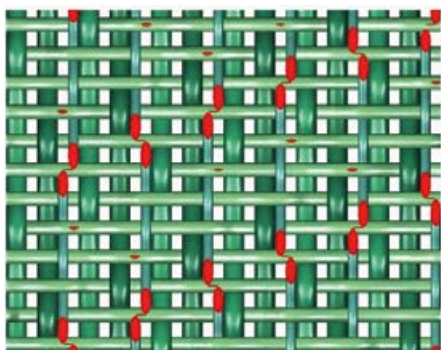
### Critical focus on the centre

“Older” SSB fabrics tend to be very open in the centre plane of the structure with **little or no possibility to reduce this openness**

**in the middle of the structure**. This is because the binding yarns run through this area and force the top and bottom layers apart (Fig. 10). Essentially this means that the designer has **little control over fabric caliper**, which can lead to an increase in void volume and give less control over dewatering. Put together, these issues can lead to increased drive load, reduced dewatering capacity, more water transportation and greater machine contamination with fibres and fillers around the loop. Plenty of reasons to take that look inside the fabric! When a single binder yarn is used in **Primoselect designs, fabric separation no longer occurs** (Fig. 11).

### What are friends for?

So, our look inside a forming fabric has shown that existing and innovative fabric designs can help reduce paper production costs in different ways – from reduced usage to providing the chance to lower power consumption and raw material costs. At the same time, when correctly applied through co-operation between user and supplier, they can help improve paper quality in several different and significant ways. That certainly sounds like a good friend to us...



Primoselect (right): centre plane full with material – lower void volume

# Nip dewatering for packaging papers

## It's not utopia! – 55% dry content with New-Tech felts!

All New-Tech Atromaxx felts are available in seamed versions!

Manufacturers of packaging papers supply a market with constantly growing demands: Lighter grades that improve logistics and handling; best possible stability, excellent printability – just a few key points based on practical experience. In terms of production, machines run faster and faster in order to fulfill growing demand. In addition, of course, production costs must be kept as low as possible: Less energy – more productivity is the guiding principle. Press felts must meet this dual requirement, which for Heimbach is standard for every application. This applies in particular to New-Tech machine clothing, which is leading the way in the production of packaging paper grades – especially where papermakers commit to nip dewatering.

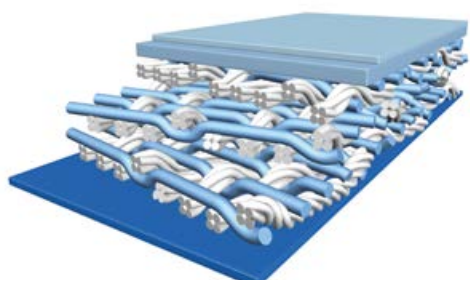


Fig. 1: Atromaxx – in a special 1+1+1 structure

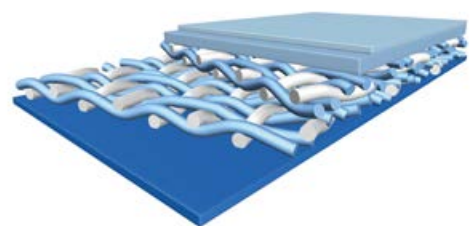


Fig. 2: Atromaxx.M consists exclusively of monofilaments

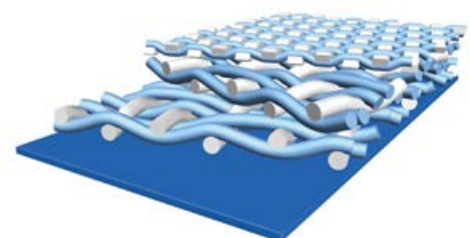


Fig. 3: Atromaxx.XF with flat monofilaments in the top layer

Top priority: **Increase dry content after the press!** For many years a value of 50% was regarded as a kind of sound barrier, an upper limit, a target value – not any more, as **requirements of at least 55%** are being increasingly discussed, especially in the packaging paper sector.

### Growth market: packaging papers

Due to online shopping, food packaging, and demand from retail chains the **worldwide consumption of packaging paper and board continues to grow**: This year approximately 243 million tons of packaging paper and board will be produced, which amounts to around 57% of total global paper production. In the coming years, the **European packaging market will grow by 3-5% per year**, as projected by industry publications. Currently more than twelve conversions and new machines are being planned in order to satisfy the growing demand for packaging papers of all kinds. This also means, however, that **paper machines have to be taken to the limits of their capacity**: the focus being on high machine availability, best possible runnability, and maximum speed.

### Challenging demands

At the same time these overall expectations result in paper technologists making further demands regarding the performance of press felts: Heimbach responds to this with innovative solutions that enable **fast start-ups and achieve the maximum in terms of nip dewatering**. Not only in terms of quantity, but also sustainable. Long lifetimes are therefore the rule – not the exception: New-Tech machine clothing frequently achieves lifetime records. Let's take a look at the tried and tested Atromaxx design, which offers multi-axial base layers that provide a **highly incompressible structure** (see Figs. 1-3): This ensures sufficient volume; open drainage channels easily cope with large amounts of water on packaging paper machines.

### Practical tip

Press felts operate best at an optimal saturation point, which is approximately 50% water content of the felt weight ( $\text{g}/\text{m}^2$ ). So for example with a felt weight of  $1,600 \text{ g}/\text{m}^2$  the water content should be around  $800 \text{ g}/\text{m}^2$ .



### Machine clothing in detail

In order for press felts of this state-of-the-art generation to best develop their performance characteristics with the objective to create high-level efficiencies, **all base layers and batt modules – including combinations of these – must be customised.** Every New-Tech felt is adaptable. Its distinct characteristics can be adjusted to every machine and every nip: High batt and base layer capillarity that initiates water flow from the paper sheet is a given; additional characteristics are **open volume, permeability and high compressibility.** Batt and/or base achieve optimal relaxation. Papermakers are impressed by numerous practical applications: The New-Tech generation of the current Atromaxx family has, thanks to its multiaxial construction, **boosted nip dewatering and thus achieved higher dry content** (Fig. 4); longer lifetimes have also become the norm. →

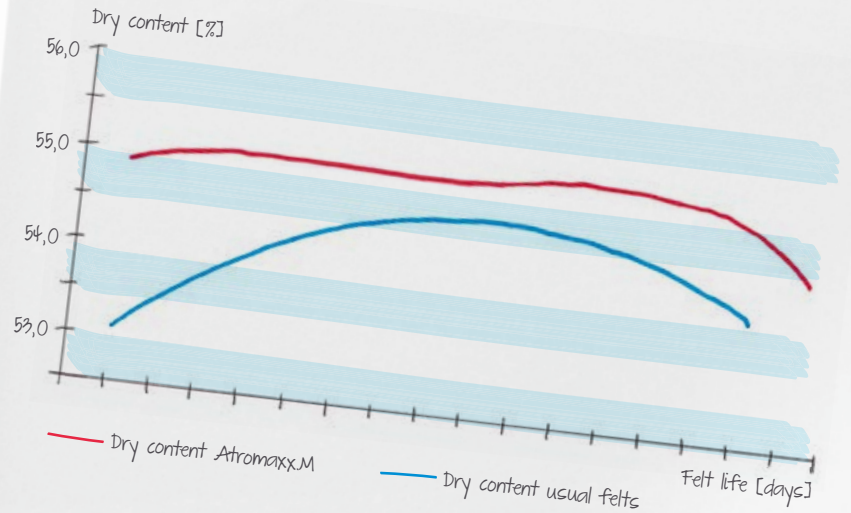


Fig. 4: Comparison of dry content after the 3<sup>rd</sup> press (shoe press)



### Nip in action

When the reduction of UHLE box vacuums is desired, nip dewatering is called for: be it as a completely new method or in order to **increase existing dry content after the nip**. The relevant dewatering behaviour is determined by three factors: machine speed, pressure impulse and degree of felt saturation (Fig. 5 and 6). At low speeds (< 600 m/min) it is virtually impossible to achieve nip dewatering. However, its significance rises with increased speed – for a variety of reasons: Firstly, **sufficient nip dewatering is a precondition for being able to reduce UHLE box vacuums in the first place,**

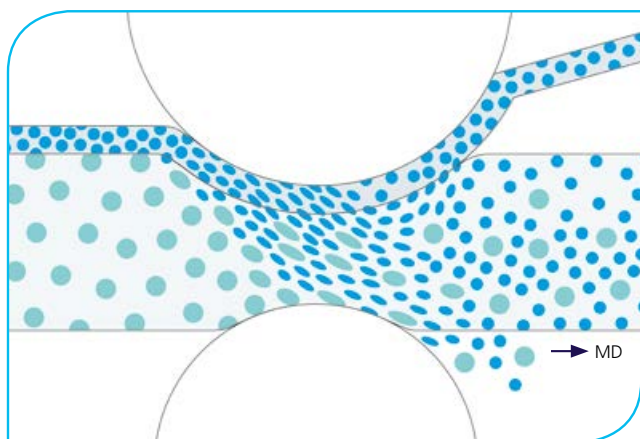


Fig. 5: If a felt is too dry (insufficient degree of saturation) the nip dewatering process cannot reach its potential

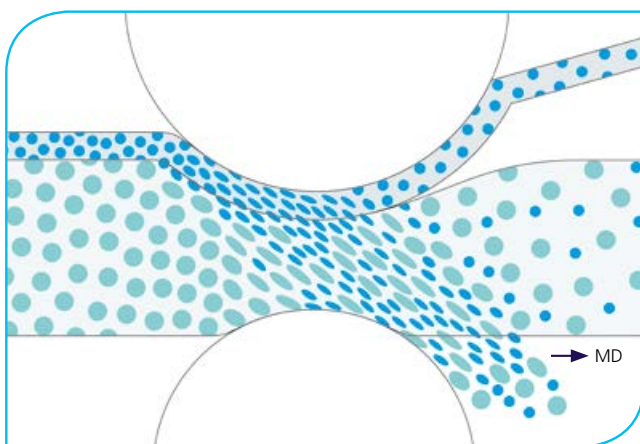


Fig. 6: This is how it should be – optimal saturation, best nip dewatering

which results in massive energy savings. On the other hand total dewatering increases, to the benefit of runnability.

### Switch off the UHLE box

The rules of physics are against UHLE box dewatering on fast-running machines – there is simply not enough time available for it! With a speed of 1,500 m/min and with two UHLE boxes, each having two 15mm wide slots, the **dewatering time is less than two milliseconds** (Fig. 7). In order to dewater at least “adequately” more than two UHLE boxes are necessary – each with extremely high vacuums. Clearly, therefore, **the answer to the question of which dewatering method to prefer for fast-running machines is nip dewatering!** This is also because nip dewatering creates a strong “felt-flushing” effect, which leads to continuous self-cleaning of the felt. Also, **felt wear over the slots is considerably reduced** because UHLE box vacuums are lowered – if not shut off completely.

### Unrivalled flexibility

Anyone who applies this method of dewatering will soon realise that there is a much reduced braking effect with the felts, which pays off through **reduced load absorption on the roll drive**. Again: less energy – more productivity. And for this to work long-term it may be necessary to **shift the proportions of UHLE box and nip dewatering**, sometimes considerably. For Heimbach’s New-Tech products this does not pose a problem, as one and the same felt is able to tolerate changes in the type of dewatering and cope with any changes without sacrificing performance. Before any felt is delivered applications personnel and the customer define requirements, upon which the production process can begin. Thus over a lifetime interval **where the paper grade is unchanged, speed can be increased to raise production output.**

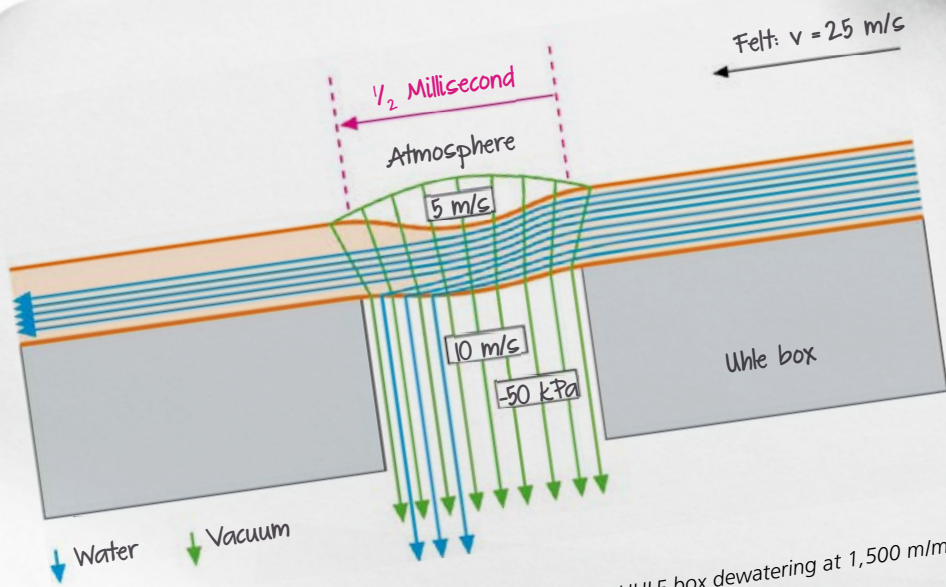


Fig. 7: UHLE box dewatering at 1,500 m/min

### Numerous benefits

One rule of thumb always applies in the sector: If you increase the dry content after the press by only one per cent – you make **steam savings of four per cent!** However, high dry content after the press not only significantly reduces energy costs – **it also improves runnability**, prevents sheet breaks (Fig. 8) and other paper defects or profile faults or losses of speed. Transferring the sheet to the final section as dry as possible also helps **improve machine cleanliness**, as wetter sheets can leave deposits on dryer fabrics and rolls – which do not occur with paper that has been dried as effectively as possible.

### Atrojet: A model of consistency

The youngest member of the New-Tech family – the Atrojet press felt – has long been recognised as an efficient “dewaterer” as well. Mainly because this product series is the **first to combine the best properties of two product families**: Atrocross and Atomaxx. Specific base layer modules have been combined into one whole in a multiaxial construction, resulting in →

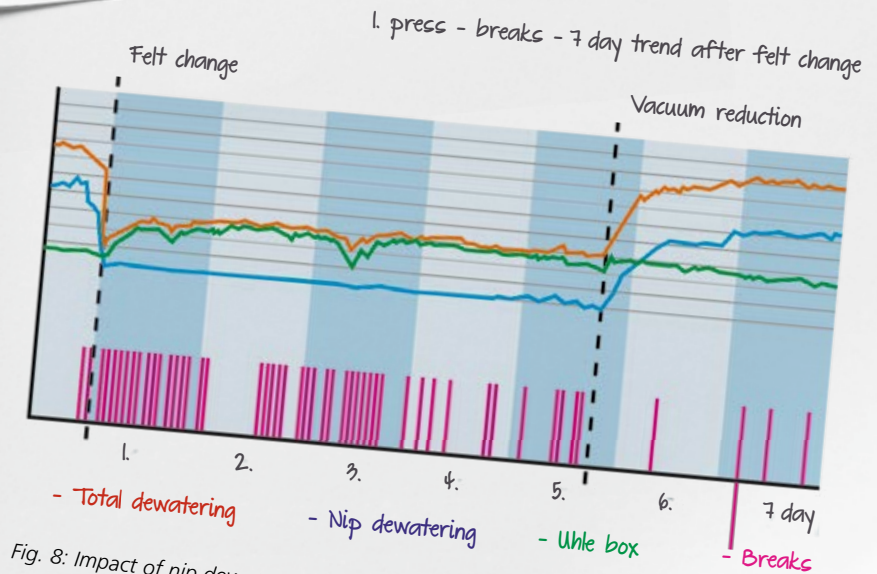


Fig. 8: Impact of nip dewatering on frequency of sheet breaks

## Real value

### Nip and New-Tech – your benefit:

- high dry content after the press – **more than 55% possible**
- less energy consumption
- longer lifetimes – maximum safety
- reduced felt changes and less use of cleaning agents
- better machine hygiene
- higher production volume

## Principle – benefits – requirements for efficient Nip dewatering:

### Principle

The amount of water being pressed from the sheet should be taken up directly in the nip – **as completely as possible** – by the storage volume of the roll; water should not be transported with the felt to the UHLE box!

### Benefits

- With a high level of nip dewatering overall dewatering increases as a rule and the dry content after the press rises. As a result runnability improves significantly (e.g. fewer sheet breaks, reduction in edge problems); moreover, steam is saved in the dryer section and production is increased.
- This type of dewatering is the most effective method to keep press felts clean and open.
- In addition, UHLE boxes can be operated with a low vacuum – or even shut off, resulting in enormous energy savings.

### Requirements

- Sufficient storage volume in the press roll covers and shoe press belts so that water exiting into the nip can be absorbed.
- Savealls with sufficient capacity to collect accumulated water.
- Efficient doctoring to avoid water rings.



**Important: Please only use selected felt designs that are custom-made for nip dewatering.**

compelling arguments in its favour: excellent dewatering behaviour, high dimensional **stability, maximum residual strength values and very good wear resistance.**

Atrojet delivers a unique “homogeneity from the inside out”; which is the basis for a high level of adaptability allowing every felt to be fine-tuned to machine, grade, and speed.

You can read more on Atrojet and its practical applications from page 14.

### Tuning with Fast Forward

#### Heimbach’s innovative Fast Forward (ff)

is also on the way to becoming a trendsetter,

and can be applied to New-Tech products. ff stands for: **fast start-ups at any time**, as this add-on product makes it possible to significantly accelerate start-up speed. From the outset paper technologists can benefit from **high dewatering and simultaneously from first-rate runnability** over the entire felt lifetime (Fig. 9). This “start-up turbo” can be applied to any Heimbach press felt designs and pays back as quickly as it starts up: As the **operating window is reached directly** with “Fast Forward,” it is possible to achieve significant increases in production – another step towards full capacity utilisation: Some manufacturers reach maximum productivity after only one hour – instead of three days, as it was without ff.

### Dry content of the future

And just as the money triangle is a thing of the past, so **dry contents of 55%** and more after the press is no longer wishful thinking: New-Tech press felts have already realised such values on some packaging machines producing testliner and fluting. Of course, above 55% is not yet the norm and can only be achieved when **machine-specific sizes, the right press felts and other parameters mesh in a near perfect way.** Nevertheless, such figures already prove what is possible even today – for example with a combination of nip dewatering and Atromaxx.

### Atromaxx: Proven many times over

This New-Tech design impresses with its modular structure and high void volume. **Each Atromaxx is precisely configured** so that the Z-Direction is as open as possible. Papermakers obtain a perfectly balanced saturation window that allows optimal water flow. Just like Atrojet, homogeneity is a central

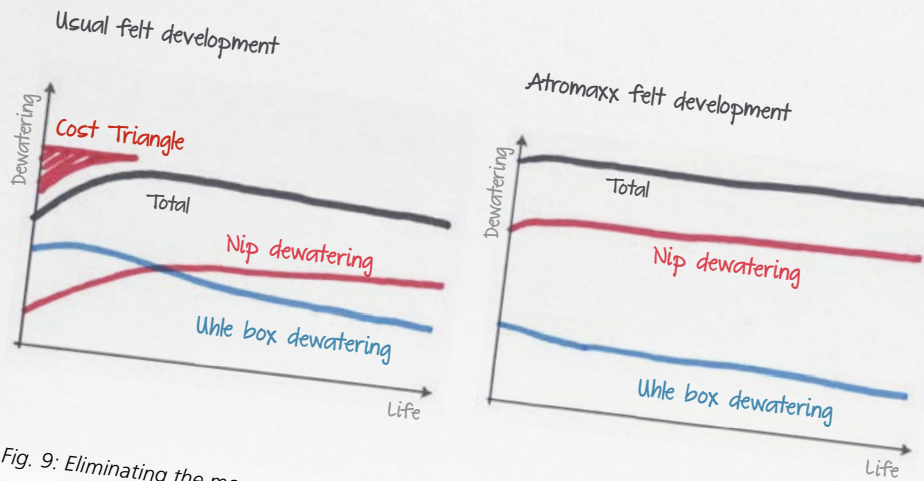


Fig. 9: Eliminating the money triangle when using Atromaxx

catchword for this press felt that has only **very few MD and CD structures**. As every module combination is "multiaxis" the base construction presents a unique, extremely consistent structure.

**Start up quickly, dewater well, operate clean and cost-efficiently: with New-Tech press felts from Heimbach.**

### Sample calculation: increase in production

Let's take a look at a paper machine with a width of eight meters producing test liner at 1,250 m/min.: Assuming 120 sheet breaks per year that interrupt production, papermakers lose approximately **30 hours of downtime** (15 min/break). Statistically improving this aspect alone quickly leads to increased production with a **turnover of more than 500,000 Euros**. This is before taking into account longer felt lifetimes: **New-Tech lasts longer, you have fewer shutdowns** – even more sales potential! A basic example that shows two things: First, the payback period is very short as every New-Tech press felt **always yields much more** than it costs. Second, you now know why New-Tech is often referred to as "tailor-made efficiency" amongst colleagues.

# Consistently good

## Atrojet convinces in every way

When the first Atrojet was installed on a paper machine at the end of 2012, nobody could have predicted the success story of this New-Tech press felt that would follow. Today, around six years later, the properties of the Atrojet product have proved themselves many times over: Consistency is the most significant factor, as Atrojet's homogeneity is way beyond anything that was technically possible before.

The specific Atrojet concept combines the advantages of the proven Atromaxx and Atrocross product lines: This advanced technology stands for **New-Tech Designs**, which combine the features of multiaxial felt structures with non-woven modules.

### Convincing product benefits

Atrojet is available for all applications. Whether it's graphic grades, packaging papers/carton board or tissue paper:

Tailor-made solutions deliver **excellent start-up performance combined with maximum dewatering**. The basis for this is custom-made units (Fig. 1), whose yarn construction and –count are tailored to the relevant machine. Homogeneity from the inside guarantees **very even paper profiles and surfaces**. The result of this is optimal pressure transfer onto the sheet. Dimensional stability is equally as high as residual strength and abrasion resistance.

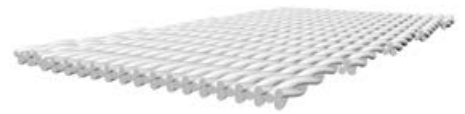
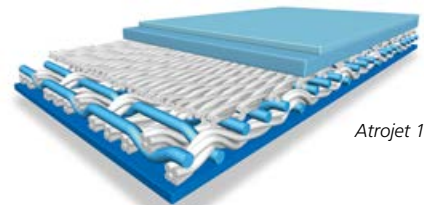
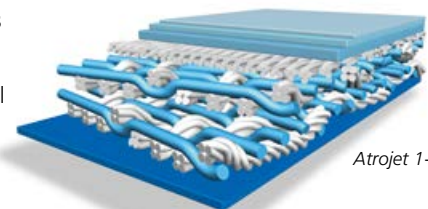


Fig 1: Atrojet top layer module in single view



Atrojet 1+1

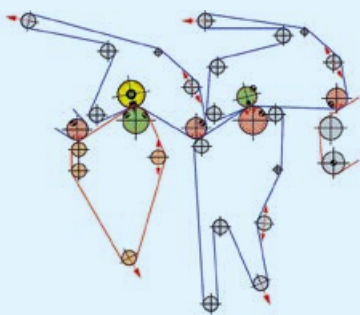


Atrojet 1+1+1

*atrojet.*

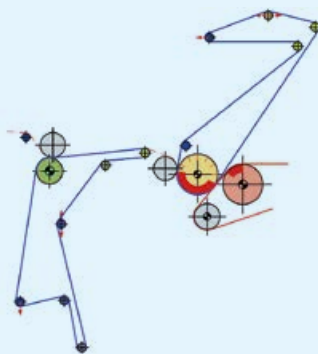
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### Reference 1

**Configuration:** Optipress  
**Speed:** 1,600 m/min  
**Width:** 11.10 m  
**Paper Grade:** Copy Paper 60–100 gsm  
**2<sup>nd</sup> Press Top:** Atrojet 1+1+1  
**Evaluation:** Fast start, very good dewatering, no hydraulic marking. Record production over total felt life

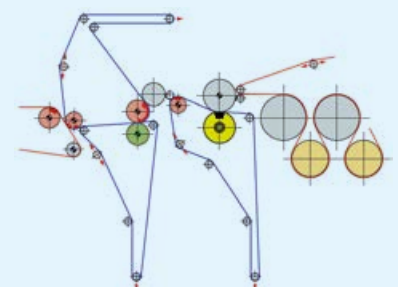


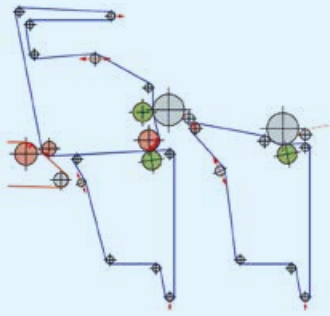
### Reference 2

**Configuration:** Combipress  
**Speed:** 350 m/min  
**Width:** 2.60 m  
**Paper Grade:** Décor paper  
**Pick-up:** Atrojet 1+1+1  
**Evaluation:** Very good performance, no shadow marking from pick up roll; significant improvement in paper quality  
**2<sup>nd</sup> Press:** Atrojet 1+1  
**Evaluation:** Good dewatering, good running behavior; no hydraulic base fabric marking; very good paper quality

### Reference 3

**Configuration:** Sympress-1 with Symbelt  
**Speed:** 1,000 m/min  
**Width:** 2.90 m  
**Paper Grade:** Wallpaper base 95–150 gsm  
**Pick-up:** Atrojet 1+1  
**Evaluation:** Fast start, excellent dewatering performance



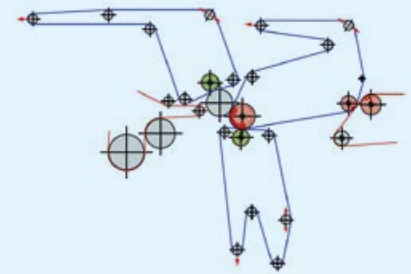
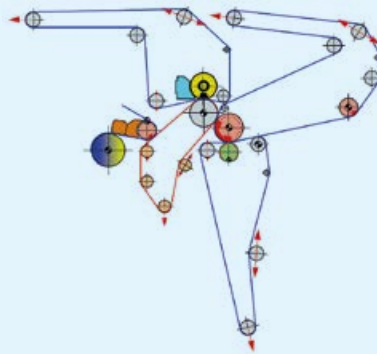


#### Reference 4

**Configuration:** Bi-Vent  
**Speed:** 780 m/min  
**Width:** 3 m  
**Paper Grade:** Copy paper, 50–150 gsm  
**Pick-up:** Atrojet 1+1+1  
**Evaluation:** Outstanding abrasion resistance (filler content in paper up to 40%), significantly longer life time compared to competition, very good drainage performance

#### Reference 5

**Configuration:** Sympress-2 3B  
**Speed:** 1,400 m/min  
**Width:** 9.30 m  
**Paper Grade:** Standard WFC, 100–250 gsm (reel)  
**Pick-up:** Atrojet 1+1  
**Evaluation:** Fast start up, good running behavior, high dewatering, long lifetime, very good residual strength

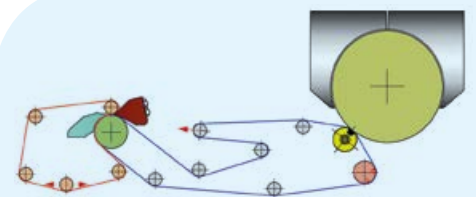
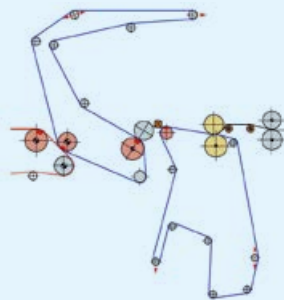


#### Reference 6

**Configuration:** TRI-NIP  
**Speed:** 1,020 m/min  
**Width:** 4.60 m  
**Paper Grade:** Thermal paper, 45–90 gsm  
**Pick-up:** Atrojet 1+1+1  
**Evaluation:** Improved start, higher residual strength after target lifetime

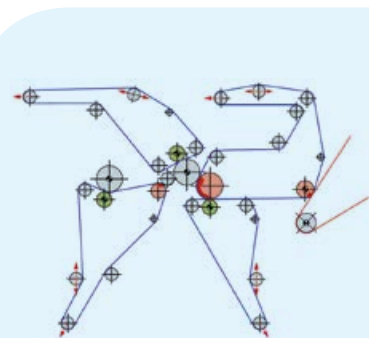
#### Reference 7

**Configuration:** Invers  
**Speed:** 400 m/min  
**Width:** 4.20 m  
**Paper Grade:** Cigarette paper, 25–30 gsm  
**Pick-up:** Atrojet 1+1  
**Evaluation:** Faster start-up and higher dewatering than competition, high abrasion resistance



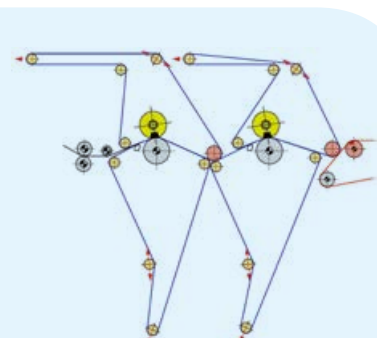
#### Reference 8

**Configuration:** Pick-up, Yankee with shoe press  
**Speed:** 1,900 m/min  
**Width:** 2.90 m  
**Paper Grade:** Tissue, 14–35 gsm  
**Pick-up:** Atrojet 1+1  
**Evaluation:** Excellent performance



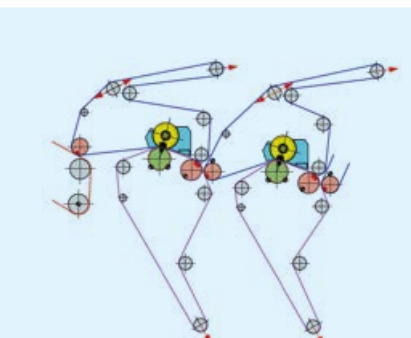
#### Reference 9

**Configuration:** Sympress-2 + 4 Press  
**Speed:** 1,300 m/min  
**Width:** 8.70 m  
**Paper Grade:** Newsprint 35–55 gsm  
**Pick-up:** Atrojet 1+1+1  
**Evaluation:** Fast start-up, very good dewatering  
**3<sup>rd</sup> + 4<sup>th</sup> Press:** Atrojet 1+1+1  
**Evaluation:** Good, vibration-free run (steel press)



#### Reference 10

**Configuration:** Tandem Nipcoflex  
**Speed:** 800 m/min  
**Width:** 5.20 m  
**Paper Grade:** Liquid packaging  
**Pick-up:** Atrojet 1+1+1  
**Evaluation:** Excellent performance



#### Reference 11

**Configuration:** Tandem Nipcoflex  
**Speed:** 1,600 m/min  
**Width:** 9.65 m  
**Paper Grade:** SC-Paper, 50–60 gsm  
**Pick-up:** Atrojet 1+1  
**Evaluation:** Fast start-up, high dewatering over long life, high residual strength after target life time

## Efficiency in the Dryer Section

### Pocket ventilation offers great potential

Dear Papermakers!

Just recently the dryer section was the focus of one of our cases. This happens very often whenever energy savings are concerned because, as is well known, nearly 65% of total energy demand comes from drying: It is therefore imperative that, for example, air inflow and outflow are correct in the hood, a place where analysis can often highlight bottlenecks or areas for improvement. This is one measure among many that help papermakers not only to save costs, but also increase productivity which similarly relies heavily on a fine-tuned dryer section. Today we will get down to the details and focus on pocket ventilation: Anyone who approaches this correctly will reap considerable rewards.

My colleague Georgi Slawtschew from our TASK service department analyses dryer sections on a regular basis: **Typically a capacity and bottleneck analysis is prepared.** This is what we did for a long-standing customer, who produces newsprint (40-60 g/m<sup>2</sup>) at 1,000 m/min. For a long time now the customer's machine has been regularly measured and successively optimised.

#### Lasting Improvement

On the basis of measurements made, we recommended a **step-by-step restructuring of the dryer section from conventional to Slalom**. This was tackled over the following few years; first the third, then the fourth dryer group (groups one and two were already running as a slalom). First

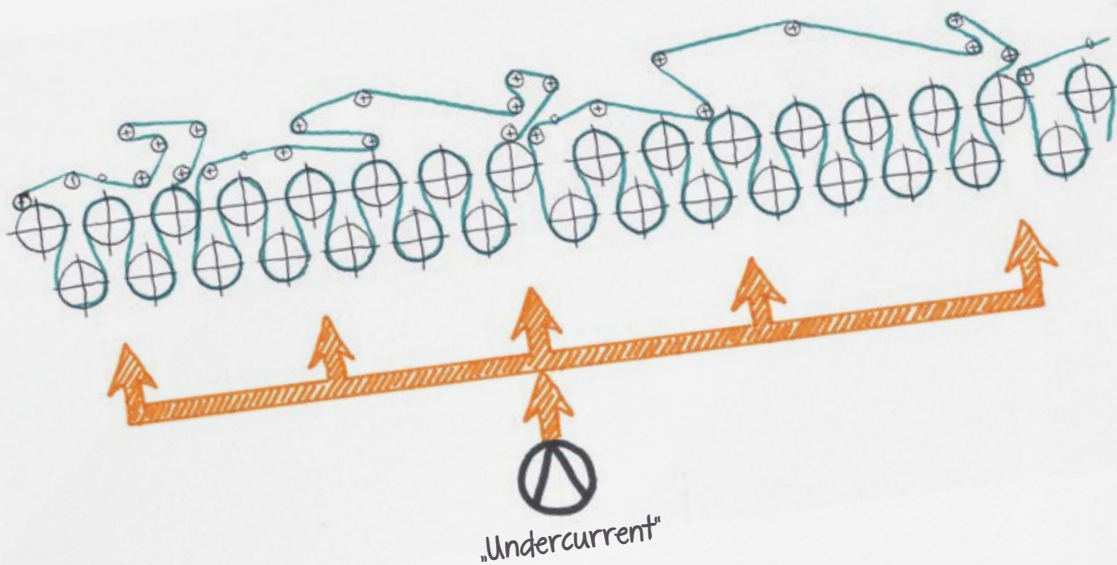
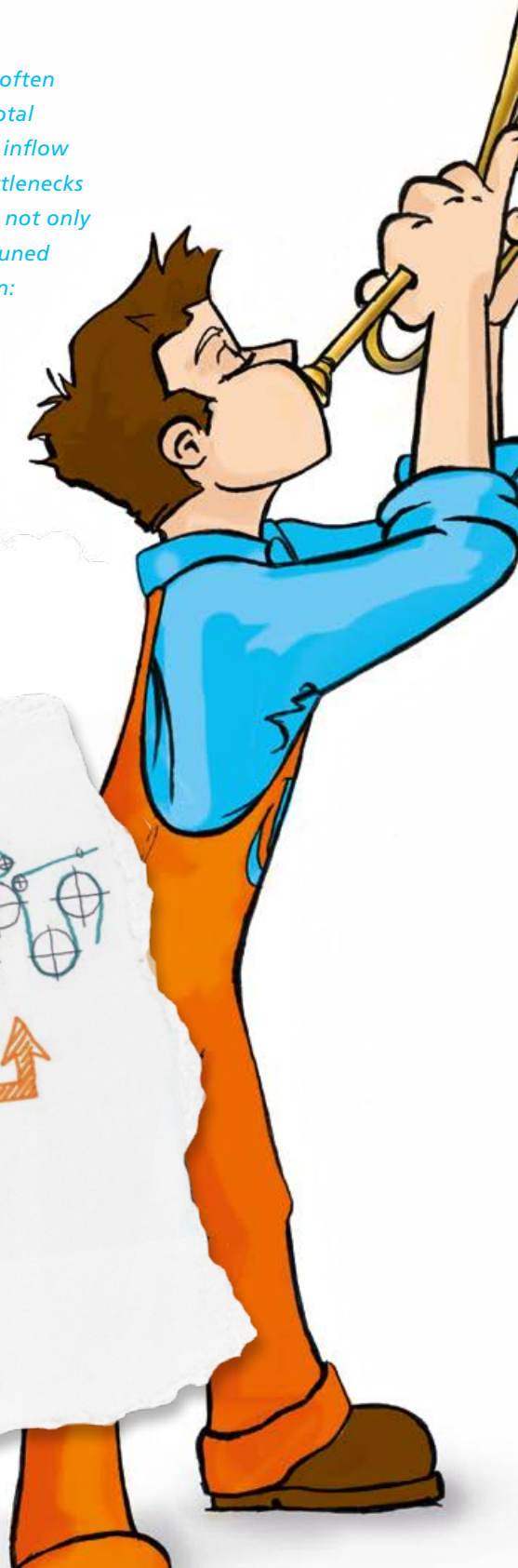


Fig. 1: Unfavourable – “undercurrent”





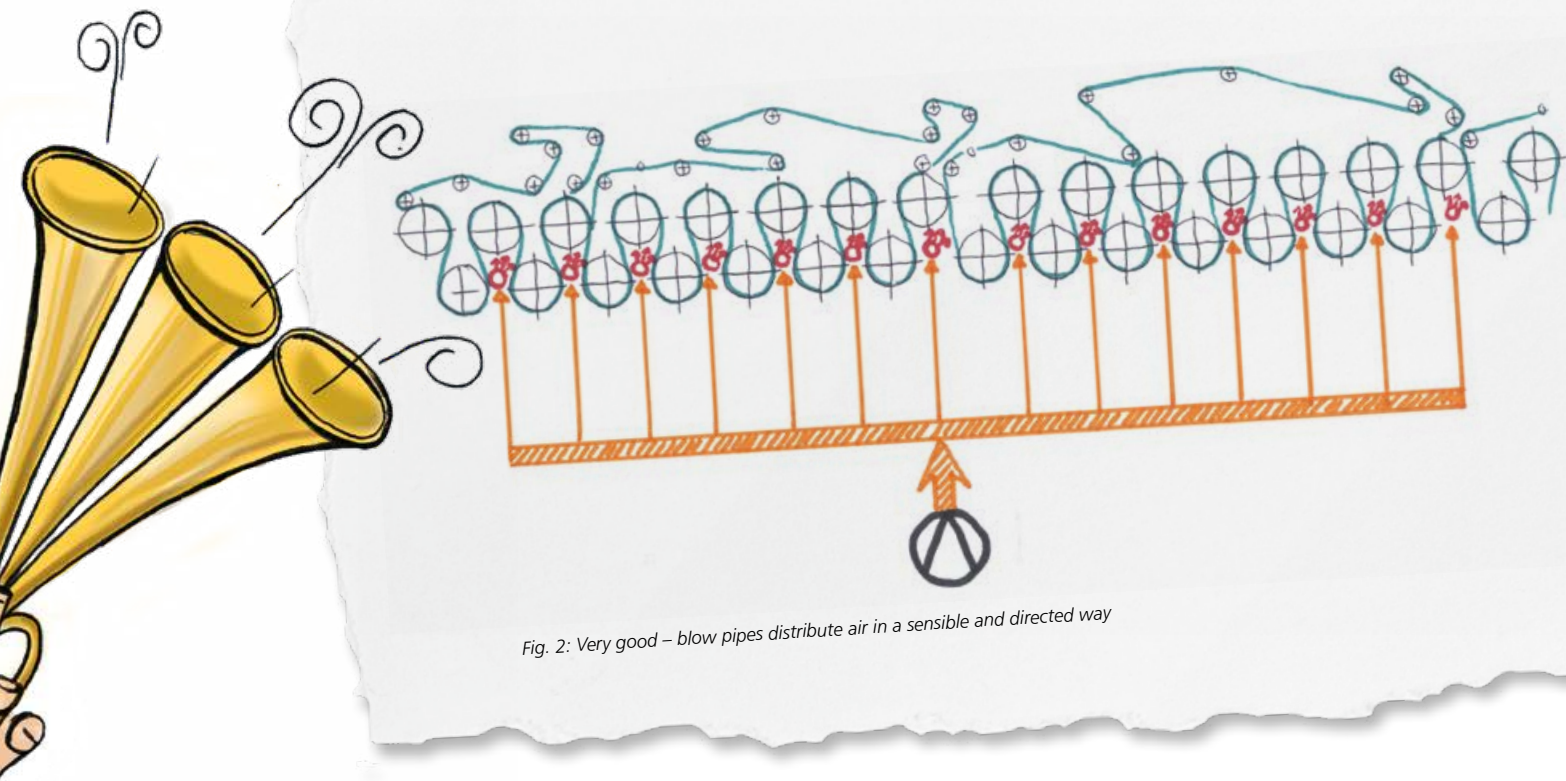


Fig. 2: Very good – blow pipes distribute air in a sensible and directed way

success: clearly improved runnability, visibly fewer sheet breaks – at the same production speed as before! Georgi summarises aptly: **“More productivity, more quality, more efficiency.”** However, we had not quite reached the end of the optimisation plan as the air inflow was still directed into the basement as “undercurrent” (Fig. 1). This means it flows past the machine but does not contribute to the drying process.

#### Blow pipes showing the way

Consequently the drying performance was still not sufficient to be able to produce heavier grades (60 g/m<sup>2</sup>) at maximum speed. In this case the path to a solution was the use of blow pipes, **which significantly improved drying capacity.** Blow pipes are built into the cylinder pockets, which in many cases means higher productivity and energy savings per ton of paper at the same time – “one measure, two benefits”, as Georgi emphasises. This was also the outcome with our local customer, though of course **all the optimisations should be considered as a whole** in this case. In total the Slalom conversions and blow pipe installations extended over a period of several years.

#### Airflow altered and improved

In the end all pockets were equipped with blow pipes (Fig. 2). Therefore the “undercurrent” no longer flows into the basement, where it is almost completely ineffective – on the contrary: From now on the air is directed where it is really needed **in order to remove the water vapour from the paper sheet as efficiently as possible.** The optimum blowpipe position in the cylinder pockets can be seen in figure 3. Ever since the air has been used in a more targeted way our customer has also been able to produce heavier grades at 1,000 m/min: **The productivity increase amounts to a very**

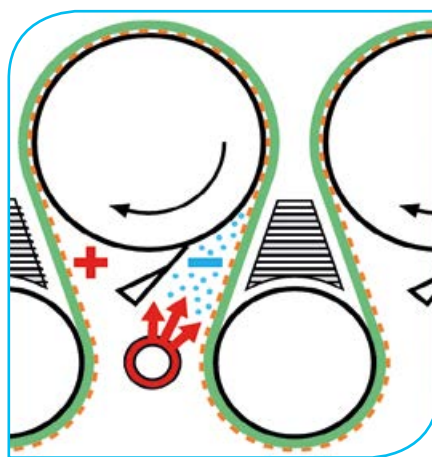


Fig. 3: Optimally placed blow pipe

**respectable 17%**, bearing in mind that installation costs were quite low. In summary this is a long term optimisation which brought the customer millions of Euros of additional turnover.

#### Great effect

If we look at the details, the customer was able to use one less dryer fabric in the third dryer group and in addition **achieve clearly improved runnability** because (amongst other things) the number of sheet breaks was reduced. The same applies to the second part of the dryer section restructuring (fourth group). If you calculate additional turnover referred to above, it is in theory possible to **add some millions to the top line.** However, this is not always so straightforward, which is why calculations of economic efficiency vary considerably in practice: “The best way to approach this”, Georgi makes clear, “is to **look at every machine for what it is: unique.**” And, naturally, if every paper machine is different, the numbers will always be relative. Nevertheless, an increase in economic efficiency of 17% can be said to be an impressive argument on its own. A sample calculation “that can truly be regarded as a good example”, says Georgi. →

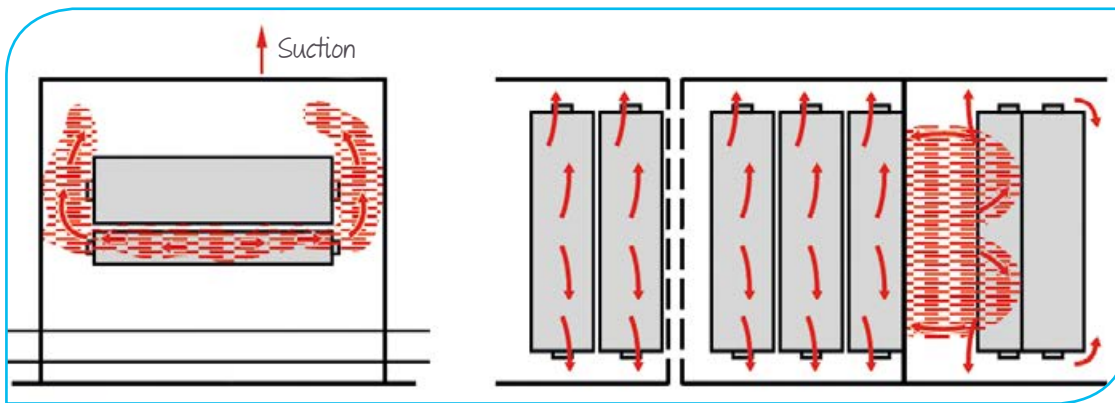


Fig. 4: Recommended air flow from the pockets

### Using blow boxes

As a general principle we can state: **Slalom groups and optimal pocket ventilation are almost always beneficial.** Blow pipes are not always necessarily needed, as other techniques have been effective. In the case of slalom groups blow boxes, for example, are a sensible alternative: These are, like blow pipes, placed behind the doctor, so that the air in the pockets is distributed evenly – **from the middle of the machine to both front and drive side** (Fig. 4). An accumulation of moisture towards the machine centre is therefore avoided; the sheet is also better pressed to the dryer fabrics. And a stabilised sheet, as you well know, dear colleagues, **significantly and effectively reduces possible sheet fluttering.** Many practical benefits, one source: optimal pocket ventilation. A further example demonstrates why – as so often – uniformity is crucial.

### Moisture: a most important detail

A customer sent for Georgi and myself in order to measure and evaluate the status of his pocket ventilation. Fig. 5 shows the TASK log including all relevant parameters. On this paper machine blow boxes were installed only in the pockets under cylinders 30, 33, 36, and 38. This gave an uneven result in terms of ventilation: In places where the pockets are ventilated **the absolute**

**moisture is lowered by 38%** – a significant reduction. Looked at the other way round: The pockets that are not ventilated contain much more moisture. In conclusion: the blow boxes make it possible for **more water to be absorbed and transported away in these pockets.** This is as obvious as it is important if we compare Fig. 5 with a different machine configuration.

### Uniformity as a benefit

The dryer group that you can see in Fig. 6 shows blow boxes in all pockets. Visible at first glance: **Everything is even.** Both the

dry air and the dew point temperatures are very regular. As a result this also affects the water absorption capacity of the air in the pocket. This means in practice: **Air flow from the middle of the machine in all pockets towards both edges.** Furthermore, the lower moisture content of the air in all pockets leads to higher water take-up capacity: "In summary, **very effective removal of the evaporated water from all pockets**", as Georgi states. Target achieved in this case too, because an optimum CD moisture profile is, as everybody knows, a key quality characteristic across all paper grades.

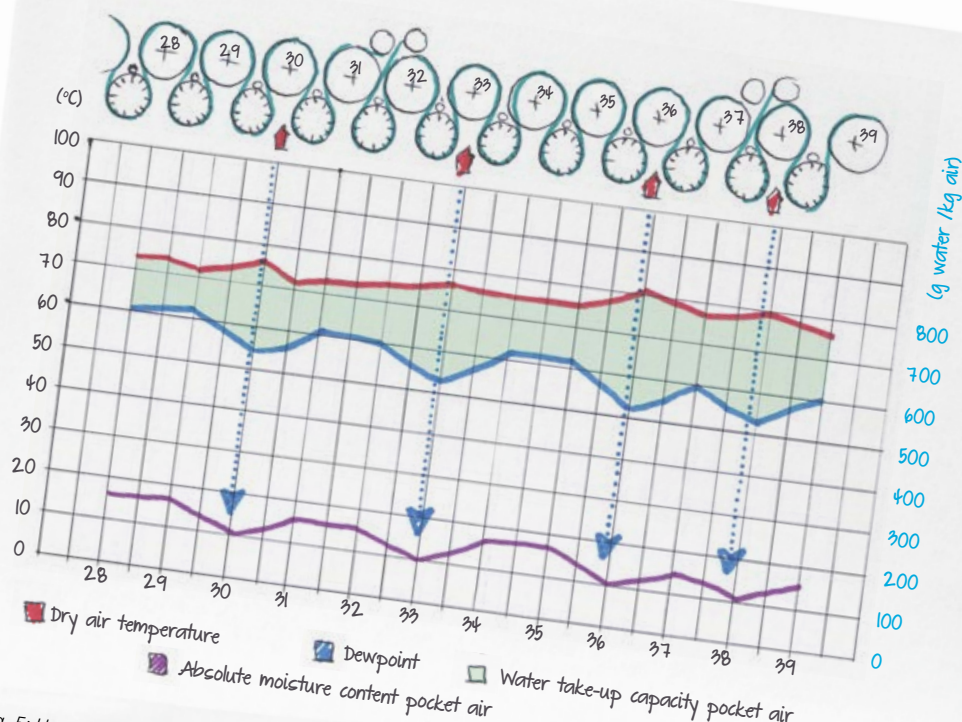


Fig. 5: Uneven pocket ventilation = uneven moisture removal

### The process is crucial

Who does not recognise them? Unwelcome wet streaks that **can be all but eliminated** with the use of the right technology and appropriate adjustment of the machine components. The examples mentioned here are certainly convincing as practical achievements, but they are all based on a process that always starts with measurements, since the appearance of moisture streaks can have more than one cause. This is why my TASK colleagues and I always recommend: **Let us create facts first by means of measurements and only then think about optimisation and restructuring.** This creates certainty, and simplifies assessment and evaluation.

### Air doctors as an option

The same was true in the third case that Georgi and I are reporting on here. A customer opted for air doctor technology, a space-saving alternative which can be considered a **combination of doctor beam and blow box** (Fig. 7): "Air doctors are very well suited to both conventional and Slalom positions", Georgi concludes. Besides optimal use of space in the pockets air doctors have the advantage of directing the **supply air directly into the wedge between the exiting sheet and the cylinder** – leading to an evening out of the vacuum created. This also applies to conventional groups.

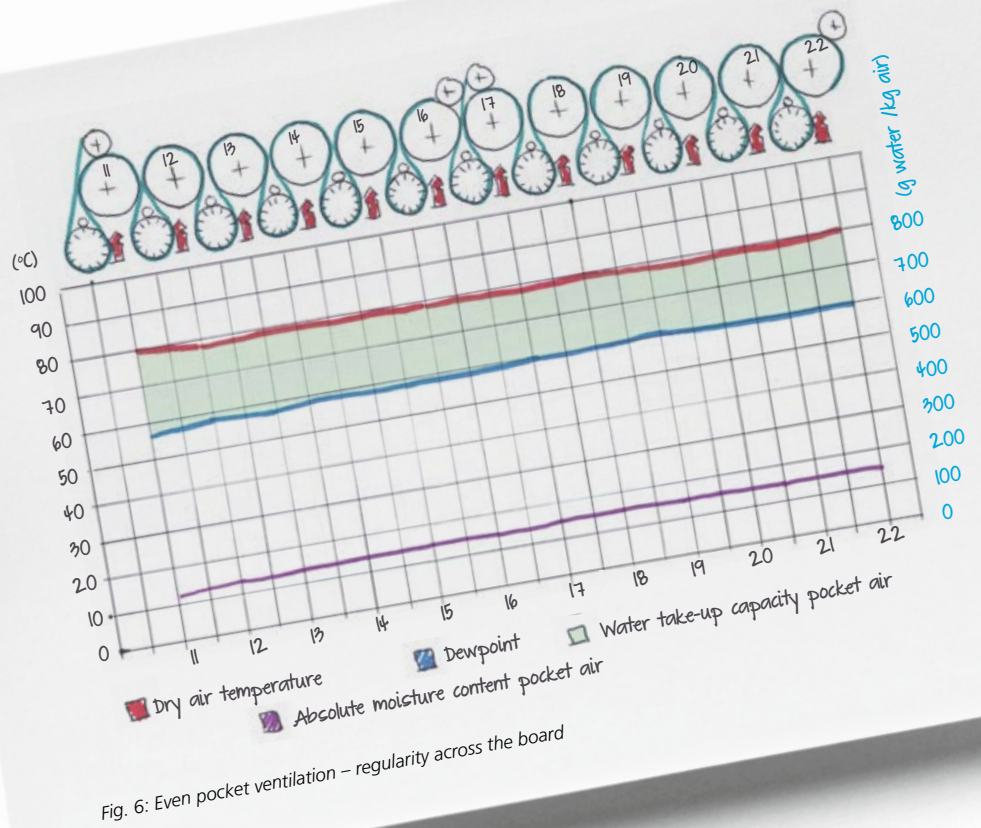


Fig. 6: Even pocket ventilation – regularity across the board

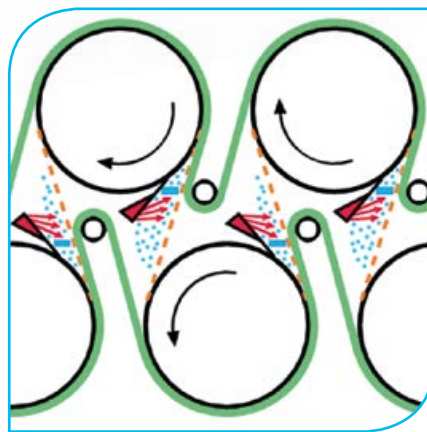


Fig. 7: Air doctors in cross section

### Overall benefit for paper technologists

No matter whether blow pipes, blow boxes or air doctors are chosen. No matter

how the dryer groups are constructed. No matter whether you are concerned by sheet fluttering, edge cracks or uneven moisture profiles: Just call us – Georgi, all other TASK colleagues and I are happy and ready to be of service by taking measurements that will help **make your dryer section perform as effectively as possible.** More efficiency, less energy consumption, better product quality: It's worth it.

Greetings from your colleague

Paper Pete





## Man of the Millennium

### Johannes Gutenberg – still making an impact today

*Without him there would be no printed matter, no bible, no written knowledge transfer. He changed the world, and in doing so, helped to take mankind into the modern age. American journalists consequently named him “Man of the Millennium” at the end of 1998. Johannes Gutenberg, the father of the printing industry, man of the second millennium. Reason enough to dedicate a few lines to him on the occasion of the 550th anniversary of his death.*

In spite of his worldwide fame, he remains something of a mystery. Nobody knows exactly what Gutenberg looked like; his year of birth is also unknown, even though it is generally assumed to be the year 1400.

#### The first of a guild

What is certain, however, is the fact that he made ground-breaking inventions: **Modern letterpress printing with movable metal type and the printing press.** When Gutenberg printed the bible that bears his name between 1452 and 1454 he could never have guessed that he had produced a benchmark for centuries. But this is undoubtedly true: **Even today, in the Gutenberg year of 2018, experts emphasise**

#### **the great aesthetic and technical quality of this pioneering work.**

The sharpness of edges and sheer precision of his printing remain captivating – and can still be admired in the Gutenberg Museum in the West German city of Mainz.



*As we recognise him – even though nobody knows exactly what he looked like: Johannes Gutenberg*

#### A Technological masterpiece

There, a fully functional replica of his original printing press invites paper and print enthusiasts to imitate the process. It was on exactly such equipment that the “Godfather of printing” produced his “B-42”, which refers to bible printing with exactly 42 lines. Experts estimate that the manufacture of the casting moulds for 290 letters alone took more than half a year. Besides Gutenberg **at least four additional typesetters and twelve printers were employed on the production of 180 copies in Latin.** When all preparatory work is added, the whole process would have taken three years to complete. This sounds a lot, but we need to put it into context.



### Commercial progress

First of all, the cost of a Gutenberg Bible was only a quarter of the handwritten equivalent; and secondly, at that time a professional scribe would also have needed three years to produce a bible! **This means a ratio of 180:1 – a considerable increase in productivity.** Obviously such facts got around quickly – even in the late Middle Ages. It is therefore hardly surprising that just 50 years later **Europe already boasted at least 1,000 printing houses in 350 towns and cities!** Gutenberg had started something, something big; something that can rightly be called a watershed.

### The world's first media revolutionary

In today's digital era it may sound a little exaggerated to call his work a "media revolution" – but that's what it was: **Not having to copy books by hand massively changed society at the time.** Printed written documents effectively became the very first mass-produced item in history. But Gutenberg's influence was not limited to craftsmanship or technological achievement, i.e. the **rationalisation of the production process of printing.** His inventions also made a lasting contribution to the faster transfer of knowledge: It is not surprising that **a few decades after the initial print more than 300 editions of the German "B-42" had been published.** The total circulation reached around 500,000 copies!

### Moving society forwards

This is particularly remarkable as the book market was only just emerging and large-scale literacy among the wider population was not yet common. **Gutenberg not only produced bibles;** his business also supplied documents that we would probably refer to today as "flyers" or "brochures". Then as now they had the same aim: Printed paper enlightens, it teaches people, it shares information. In this respect this article is not just dedicated to Gutenberg the inventor, the creative mind and businessman – his cultural contribution is even more significant: **Paper became knowledge carrier No. 1!** Even today the printed word continues to excel because the world's printed knowledge is a long way from being fully available online.

### A cultural asset like no other

Quite apart from the fact that information on the Internet does not generally offer the depth of factual and specialist books, **paper is in any case completely different from a screen!** Businesses in the sector can still rely on a globally powerful cultural asset: Despite the introduction of e-books, tactile people will keep buying "real fiction". Corporate brochures, content-rich print advertising and skillful printing technology enjoy growing popularity – despite online marketing. And there will still be readers of daily and weekly papers or magazines.

**Yes, there is no doubt that Gutenberg is responsible for an enormous and still-promising demand for paper – that is indisputable.**

### Paper is the future

In addition, new areas of application for paper solutions – across many sectors – are appearing all the time. In our "Paper is the future" column we frequently report on innovations that **promise to bring lasting and positive changes for the industry.** And even if the quantity of printed goods has decreased printed matter – **in itself – surely still represents the greatest advance of humanity.** All thanks to Johannes Gutenberg!





A happy Frank Heide with his 20 gram gold bar



Dominik Stolini (right) congratulates Robert Raniszewski from the Polish team 'BLS' on his win

# 2018

## Sweden sweeps up the prizes Winner of the Heimbach World Cup prediction game

*For the latest edition of the ever popular Heimbach prediction game a record number of 870 tipsters got together online to determine the World Championships Prediction King. Most of the podium places went to contestants from Sweden – but the winners were from Poland and North Germany.*

Frank Heide is the individual champion of 2018. Congratulations to him and to Flensburg, where our winner operates PM1 at **Mitsubishi HiTec Paper Europe GmbH**. 20 grams of pure gold are a fitting reward for his World Cup football expertise.

### Nordic dominance

In the runner-up position was Tommy Hedvall who operates PM5 at SCA Ortvisen in Sweden's Sundsvall. He was happy to receive his prize of the latest Apple tablet – and certainly also with the success of his company's other tipsters who joined him on the podium: In the individual category Hedvall's immediate colleague on PM5, Urban Lindström,

received an official Swedish national team shirt as his reward for finishing in third place. The bronze medal position was in fact shared by a German tipster under the pseudonym "Sven" who made a remarkable rise through the rankings from 250<sup>th</sup> to 3<sup>rd</sup> place!

### Polish team in front

The bronze position in the team category **also went to Sundsvall!** The tipsters from SCA Ortvisen certainly seemed to have a "feel" for the correct scores: Tommy Hedvall once again, together with his colleagues Oddmun Björkas and Mikael Mathiasson received shirts of their Three Crowns national

team. Only two teams were able to outclass the Nordic betting experts, **one of which was from Austria**, receiving a coffee-making machine plus one hundred refills for coming second. The final winners were team "BLS" from Poland who, after initial difficulties that left them trailing in 144<sup>th</sup> place, finally took the overall first place. **Tipsters Piotr Kowalkiewicz and Robert Raniszewski have each been made ten grams of gold richer.** Let's wait and see who will win in 2020, when the European Championships will be held in different European countries for the first time. One thing is already clear: the game will take place once again in two years' time!



## 888<sup>th</sup> Press Felt

for Heimbach Suzhou

At Heimbach's Suzhou plant the workforce commemorated a special event: On the 22<sup>nd</sup> August 2018 the 888<sup>th</sup> felt left what is currently the newest and most modern press felt production site. In China the number eight means good luck and therefore this success offers the opportunity for threefold celebrations.



# Heimbach TASK

Process expertise and tailored solutions

Even small improvements in and around the paper machine can often release great savings potential. Your profits can be enhanced by maximising production efficiency and keeping maintenance costs to a minimum. Place your trust in our technical know-how and sound service competence that provide effective support in optimising your processes.

See for yourself our well-established expertise and extensive technical service portfolio, including:

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