impressive

ISSUE 1/2016

No more wet streaks

Heimbach TASK fixes wet streaks in the paper sheet

Packaging miracle or tissue specialist

Introducing the universal talent Atromaxx

To the customer on a snowmobile

An interview with Sales Engineer Esa Alarvo where he explains how he became an Ironman

Living in a cardboard box?

Great prospects for paper applications

Primoselect long-floated

The proven forming fabric now also for packaging production

Heimbach has now tailored the successful Primoselect concept specifically for production of packaging papers. With the longest machine side float that it is possible to incorporate, the new forming fabric is perfectly suited to the high demands of the paper and board industry. The benefits for papermakers: Longer service life, lower energy consumption and high drainage capacity.

Read more on page 06.

A warm welcome to all our readers,

The first impressive of the new year starts with a sporting theme: All of the articles are about **performance, endurance and speed**. Or so we are told by our service professional **Paper Pete** in his "Wet Streaks Story", which is all about what to do to eliminate wet streaks in the sheet and how you can quickly discover the root of the problem with the help of **thermography**.

The topic of **improved performance** can be found in the article on Primoselect. How this universal forming fabric is fulfilling its potential and winning over customers even in the packaging sector can be seen on page 06. Primoselect is already considered by many of our customers to be a true **champion** and is gaining an increasing share of the market.

The robust duo for the press section come in a twin pack: **Atromaxx.M** is unbeatably strong when it comes to the production of packaging papers. On the other hand **Atromaxx.T** is a lightweight "marathon runner". This efficient press felt ensures reliable life times at the high machine speeds found in tissue production.

And finally you can read about a Heimbach employee who has gone to the limit: The Finn **Esa Alvaro is an Ironman** who never walks away from a challenge. He thrives on competition and does not spare even his customers when he invites them to participate in a fitness training session. But having fun is always paramount.

I hope you enjoy reading this issue

Peter Hahn

Managing Director

The "Wet Streak Story" – with a happy ending

What can be done to prevent wet streaks? A true story in four chapters

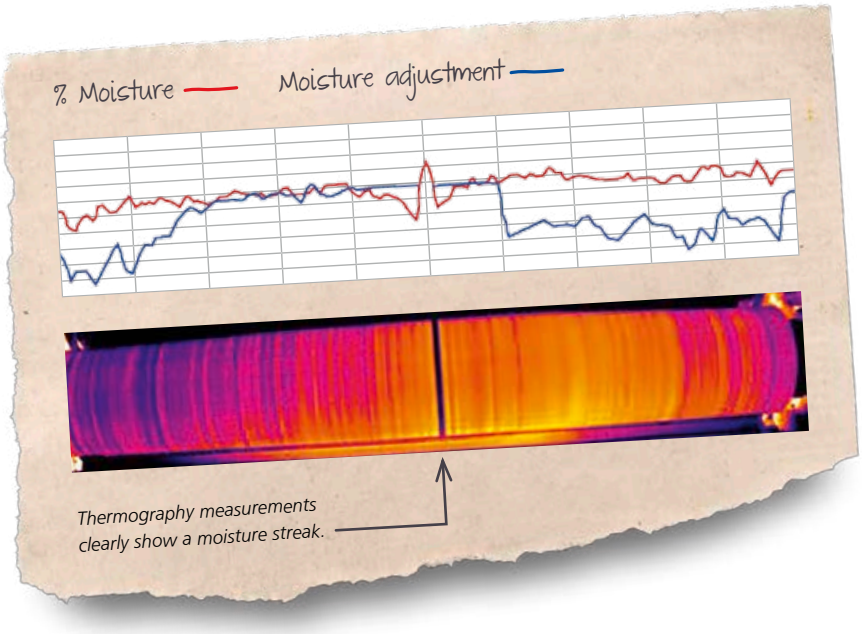
Wet streaks in the sheet are not normally the subject of a success story. Nevertheless read here how the "Wet Streak Story" reached its happy ending. Starring: Paper Pete and the Heimbach TASK Group, with thermography as a method and an infrared camera including suitable software as a means.

In the previous issue of *impressive* I gave you some advice regarding felt wear. Today – using thermography – I am looking at **the phenomenon of "Wet Streaks"**. The emergence of wet streaks in the sheet is highly problematic, because it leads to losses in production and a decline in paper quality. What the most common **causes** of "Wet Streaks" are, and how to track them down using **thermographic measurements**, is described in our "Wet Streak Story" in four chapters.

1. Chapter one: Fabric wear

A wet streak in the middle of the sheet led to loss of quality on a **newsprint machine** (1,500 m/min, 10.3 m fabric width). The machine speed had to be reduced, meaning a significant loss of production. Together with my colleagues from Heimbach TASK I took a closer look **with our infrared camera**. The image recorded a cold (and thus usually moist) streak – measurable on the sheet from the reel up to behind cylinder no. 13. The dryer fabric was checked during a sheet break and a streak was noticed in the middle of the fabric – **a clear indication of the cause of the problem**. After stopping the machine it was confirmed: The fabric was worn locally due to machine conditions and was not able to press the sheet onto the cylinder. **The causes were remedied and the fabric changed.** End of the first chapter!

My tip: It is often possible to locate a fault during operation using thermographic imagery; this means long downtimes can be avoided.



Thermography measurements clearly show a moisture streak.

2.

Chapter two: Holes in the syphon

The next challenge: A wet streak on the reel and in front of the size press disrupted production on a fine paper machine (764 m/min, fabric width 7.15 m). The thermal imaging camera was once again used. In this case, we found that the streak was first visible downstream of dryer cylinder 1. **To more clearly ascertain where the problem lay**, the surface temperatures on several drying cylinders were measured with a **contact thermometer**. These measurements showed that the temperature at the edge of cylinder 1 was significantly lower than with the other cylinders. **And so the culprit was found:** At the next shutdown the customer opened cylinder 1 and found holes in the syphon – the cause of the wet streak was found and could be eliminated promptly! Turn the page and on to the third chapter.

My tip: Heimbach's specialists are well trained in handling infrared cameras and using analysis software. If used, you can save yourself a tedious "trial and error" search for the fault.

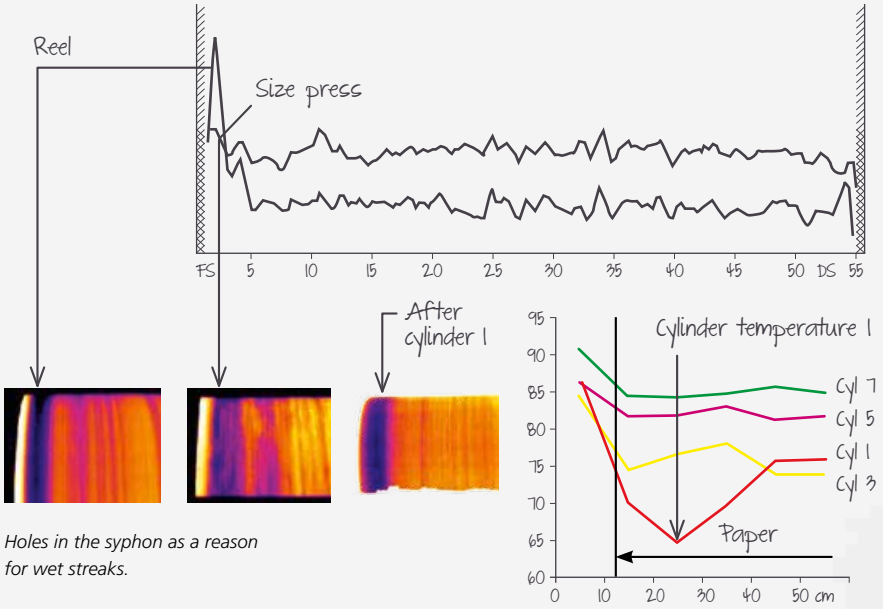
3.

Chapter Three: Oil contamination

The customer discovered a wet streak on the front side of **a newsprint machine**. The machine had to be run at a lower speed. **The TASK Team traced the path** from the reel and looked for the cause using thermography. Where did the unwanted streak appear for the first time? **We struck it rich at the fourth bottom fabric.** To confirm, we measured the cylinder temperature. As expected the temperature on the edge was higher, due to the sheet absorbing less energy as a result of poor contact.

An inspection was carried out at shutdown and it was discovered that the edge was contaminated with oil. This resulted in a low fabric tension and flapping fabric edges. After **changing the fabric** and rectifying the oil leak the problem was solved.

My Tip: Great costs can be saved by an early expert analysis using infrared and thermal imaging! Shown clearly in the example below.

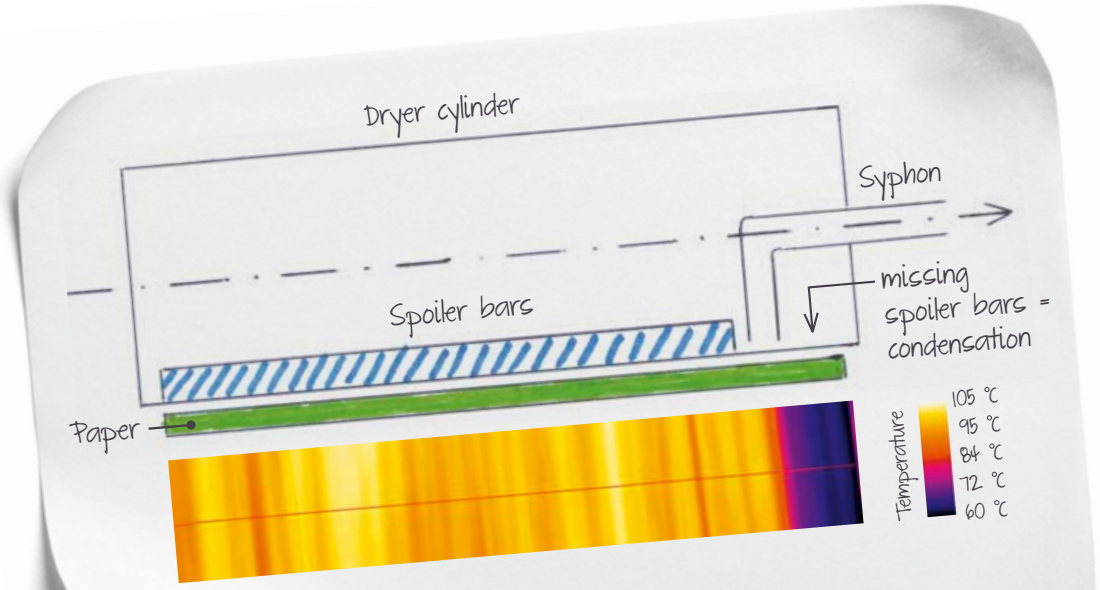


Holes in the syphon as a reason for wet streaks.

INFOBOX

Planned duration:	18 months
Change after:	10 months
Runtime loss:	**8 months**
Speed reduction:	50 m/min
Production loss:	642 tons/months
Paper price:	500 EUR/t
Loss of production:	**321,300 EUR/month**

Corresponds to approx. EUR 2,570,000



Missing spoiler bars on the back side lead to poor heat transfer.

4.

Chapter four: Missing spoiler bars

Last but not least an especially tricky and more persistent case, **where we were able to contribute to the solution** – thanks to thermographic measurement and many years of experience. The drive side of a machine producing copy paper (950 m/min, fabric width 4.0 m) was wet **for years**. Urgent help was required and my TASK colleagues reported for duty. The first measurement in 2010 showed: Something was not right in the fifth group! The recommendation from the Heimbach experts was **"check cylinders 25-32"**, this however was not done.

The second measurement in 2015 produced exactly the same results.

And this time the corresponding cylinders were checked! This resulted in the discovery that there were no spoiler bars installed on the drive side of cylinders 26-29, which maintains the condensate in a turbulent state providing **a better heat transfer**. When there are no spoiler bars a closed ring of condensate is formed (see Figure above), this reduces the heat transfer to the paper.

All's well that ends well!

I have shown you four examples here, however the show goes on: When wet streaks appear, thermographic measurements can help to reduce the extent of the problem. As, **cutting-edge technology helps Heimbach specialists to discover what the eyes cannot**. Your advantage: better run, higher efficiency, less loss of quality and less shutdowns.

And now: Close the book and till next time

Your Paper Pete

MY TIP:
Call the Heimbach TASK as soon as possible. While we measure, your staff can be employed elsewhere. Save money twice!

New Forming Fabric Product line from Heimbach

Important additions to our packaging portfolio

Continuous improvement is a part of daily business in the manufacturing industry today. This applies not only to production processes, but also to product lines themselves. In the Paper industry the landscape is changing more quickly than ever and for suppliers into this business, there is a constant challenge to respond to changing demands and conditions.

Innovation as a way of life

Heimbach is fully committed to introducing innovations that cater for these changing requirements. The most recent example is the development of the **first woven SSB forming fabrics to use *single binder yarn*** technology in place of the paired binders used in conventional SSB designs throughout the industry. From our patented Primoselect product line, the first fabrics came onto the market in 2013 and were targeted at fast-running graphic machines. Over the last 18 months these products have become a standard feature of our portfolio and are in common use across Europe and Asia. We regard the 50 % year-on-year growth as phenomenal.

If we look back further, Heimbach's track record in bringing major technology shifts to the market – benefitting the industry as a whole – is good. In the late 1990's we were among the first suppliers to deliver **SSB** forming fabrics. Before and during this period, Heimbach introduced **Duralon** yarns, the first material to offer benefits in both wear resistance and energy consumption. Early adoption of new weaving and seaming technology has certainly been a factor supporting these developments.

Adaptation for packaging grades

Back to the present, and we continue to explore new ways to save costs for our customers. Experience with **Primoselect** on graphic paper applications gave us numerous indications of superior performance – in particular on high speed Gap Formers – such as longer life, lower vacuums and higher dryness

leaving the forming section. Therefore, as paper consumption patterns changed and packaging papers increasingly emerged as a growing segment we began in 2014 to explore a range of products utilising the unique **Primoselect** single binder concept but specifically **adapted for packaging paper production**. This included a significant modification to the machine side configuration with the longest "float" that can be produced – a 12 shaft repeat. Adding this life-enhancing development to the low power and high drainage capacity of **Primoselect** fabrics, we have a forming fabric perfectly adapted to the demands of the packaging market.

Outstanding results

Having now delivered more than 100 pieces, we have a wealth of practical evidence of the benefits the Primoselect concept brings. We have minimal cases of converts to Primoselect packaging fabrics reverting back to standard designs.

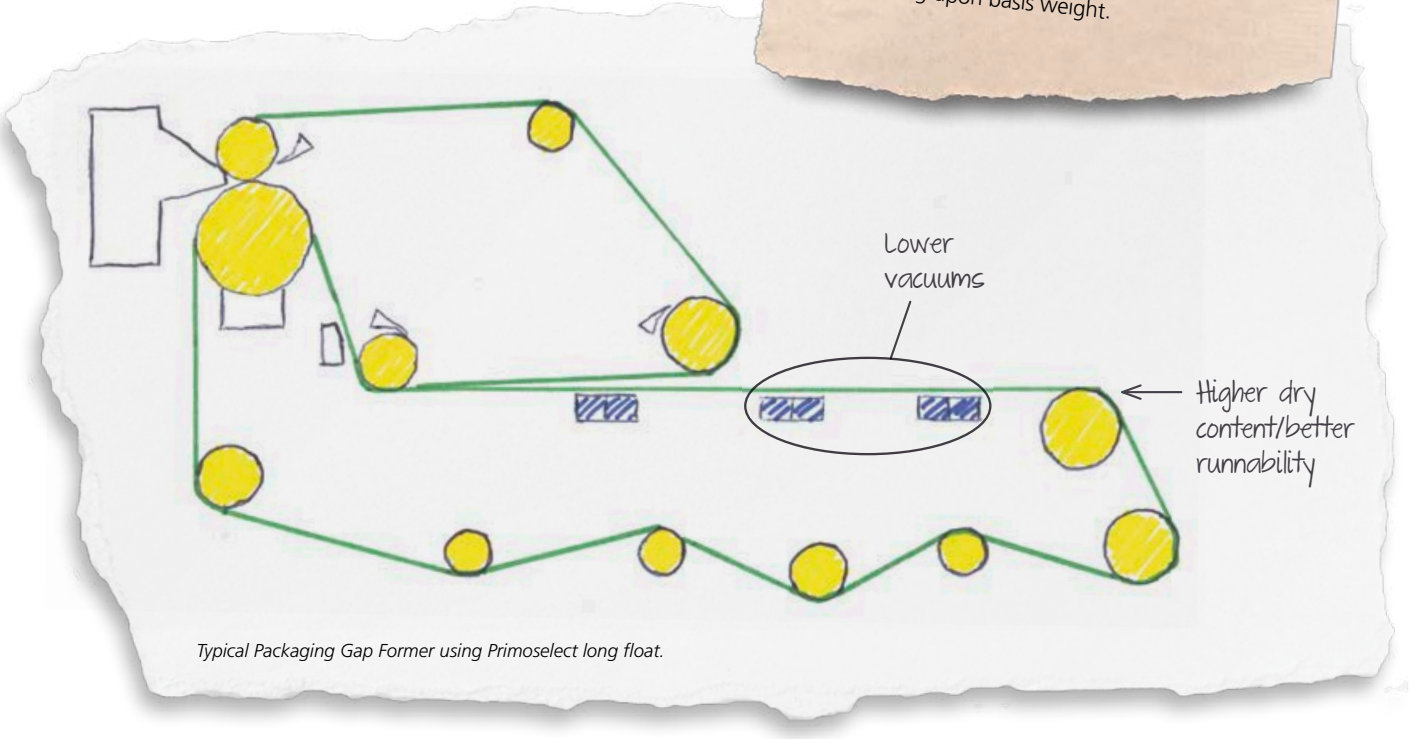
INFOBOX

Case study

Former: Duoformer
Speed: 1,050 m/min
Width: 3.30 m
Paper Grade: Packaging

- Primoselect runs cleaner
- Reduced paper breaks from 4 to 1 per day
- + 1 % dry content after couch roll
- Better formation due to higher drainage capacity – headbox slice opening 10-11/12 mm possible
- Increased life from average 45 days to 87 days
- Ideal for high wear applications like Gap Former bottom position

The headbox slice lip can be opened in order to achieve improved formation and sheet strength – a major benefit. Primoselect could allow to slice to be opened by an additional 10-20 % depending upon basis weight.



Typical Packaging Gap Former using Primoselect long float.

Lifetime in focus

In the last months we have focused on further expansion of the product line to allow Fluting and Liner producers to benefit from the **Primoselect** competitive edge. Here the primary focus will always be life potential with the aim to reduce machine downtime. At this point it is worth taking a look at how we measure and assess life potential.

How do we quantify wear volume

In order to understand this most critical subject we have to look at the **material content that is available to be worn away** over the life of the fabric. This is illustrated below with the critical yarns coloured in red. The life potential of the forming fabric will be proportional to this volume.

In understanding life potential, the weave pattern, yarn material, yarn diameter and number of yarns are all important factors.

As far as yarn material is concerned, as a rule Heimbach use an optimised combination of Polyester and Polyamide, the materials most commonly used in the production of forming fabrics today.

The weave pattern, yarn density and yarn diameter provide the volume of material that can be worn away and by calculating this volume we are able to compare one design against another very easily. On Heimbach data sheets we always provide a wear volume calculation in cubic centimetres per square metre (cm^3/m^2) so that it is easy to make comparisons between products.

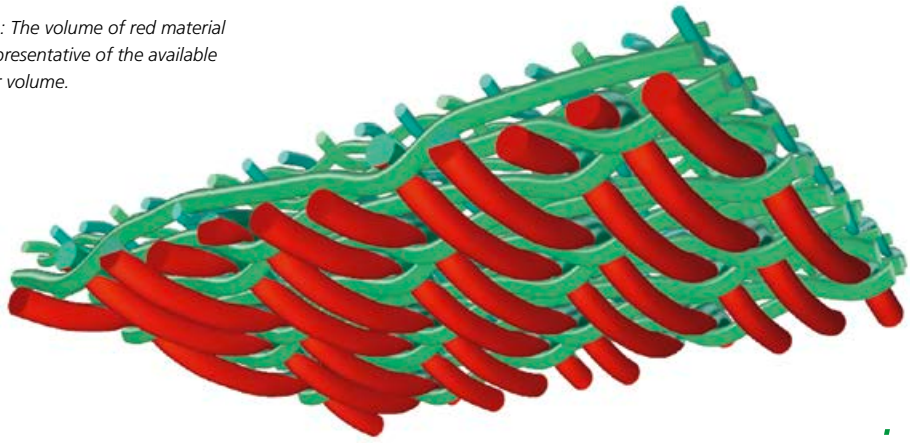
For all suppliers there are limitations in terms of yarn diameter, so the best way to provide additional wear volume would be to consider the weave pattern itself. If we look at the volume of red yarn in fig 2.1, we can see that the volume of material available to resist abrasion in the 4 shaft machine side pattern is very small. Extending the distance between locking points by moving to a 6 shaft configuration (fig 2.2) clearly shows an increase in the capacity of this design to resist abrasion. Another major improvement can then be seen in **the 12 shaft version** (fig 2.3).

The secret is in the long float

The latest **Primoselect** forming fabrics incorporate this new **12 shaft** machine side configuration, and show life improvements up to **30 % more** than alternative standard designs. We achieve this extra wear resistance potential via a combination of the unique weave pattern and by using machine side cross direction yarns with a diameter range of 0.35 mm to 0.5 mm (see table below).

The new Primoselect packaging product line is nearing completion, though this will not stop us from continuing to explore new ways to provide benefits to papermakers.

Fig.1: The volume of red material is representative of the available wear volume.



primoselect.

Fig. 2.1: 4 shaft machine side – lowest wear volume (used in tissue).

Fig. 2.2: 6 shaft machine side – increased wear volume (standard).

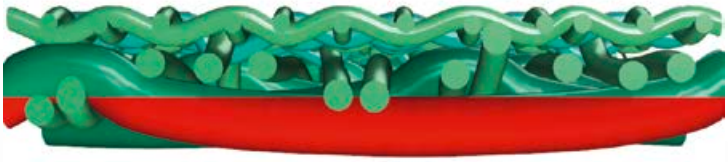


Fig. 2.3: 12 shaft machine side – highest wear volume.

Fabric	Paper Side Mesh x Count MD x CD / cm	Yarn Diameters MD : CD mm	Support Points No. per cm^2	FSI	Caliper mm	Air Perm cfm	Wear Volume cm^3/cm^2
A	29 x 25	0.13/0.21 : 0.17/0.45	738	135	1.11	370	151
B	29 x 23	0.13/0.21 : 0.17/0.45	668	127	1.11	410	137
C	29 x 21	0.13/0.21 : 0.17/0.45	621	122	1.11	450	129
D	29 x 31	0.13/0.21 : 0.15/0.35	889	154	1.01	370	109
E	22 x 22	0.20/0.27 : 0.20/0.50	481	110	1.40	370	153
F	22 x 20	0.20/0.27 : 0.20/0.50	455	106	1.40	410	144
G	22 x 18	0.20/0.27 : 0.20/0.50	428	102	1.40	450	136

Fig. 3: Technical information on several high life Primoselect designs.

Already knew?

Source: Stange Design

House made of cardboard, motorcycle made of paper

Paper applications in lightweight construction – potential for many future technologies

Paper has many excellent qualities, but one very special characteristic is its recyclability. In times of shortage of resources this makes the material permanently valuable – and interesting for a whole range of future developments: for technological applications that today still appear futuristic, but are in fact already on the way from research to production.

In the last *impressive* we showed an igloo made of paper – an example of what can be made from this versatile material outside of typical boards, tissue and newsprint. **The paper market is constantly in motion** and will remain so in the long term: The production of packaging and hygiene paper is rising steadily, but graphic paper production is falling due to growing digitisation (e.g. eBooks and ePaper). So manufacturers must use opportunities provided by **new markets and fields of application**: Just like in the textile sector, where functional clothing with innovative high-technical equipment (coating, self-cleaning, breathability, etc.) is becoming increasingly more important, this

process is also taking place in the paper industry. **Future technologies are in demand** and will be diligently brought forward in cooperation with partners from research and development. The **subject areas** here are numerous, but primarily the following:

- Living & working
- Mobility
- Nutrition
- Logistics
- Health & hygiene
- Information, communication, education & knowledge
- Future buildings & architecture

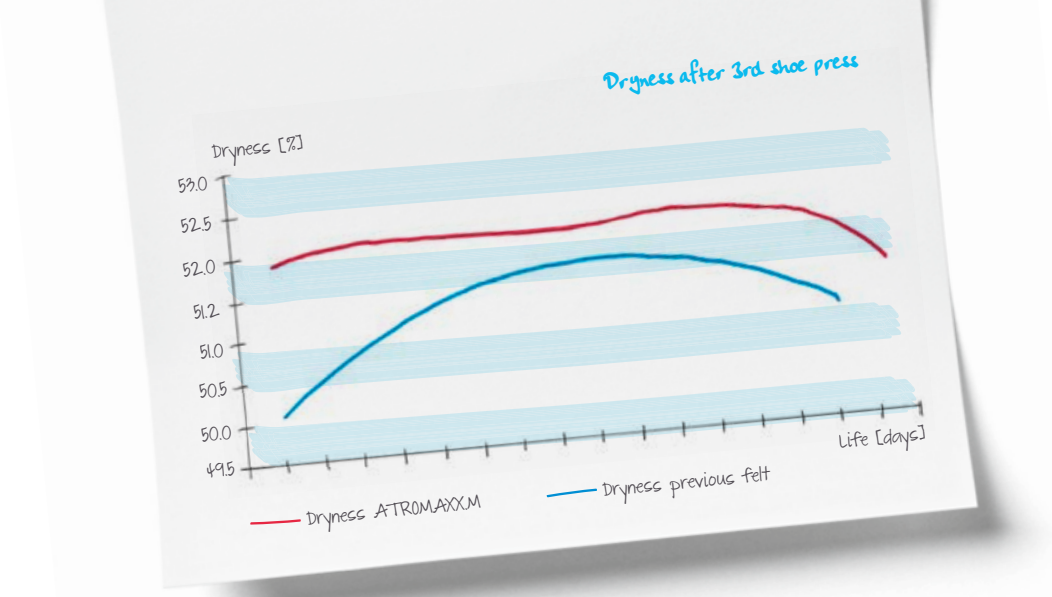
Example Living: Furniture made of cardboard and paper is no distant future project, we have actually already seen some. A few homes already contain many stylish designer stools, armchairs and tables made from this organic material. But how versatile is it for entire **houses, created in a mobile construction method**, for flexible relocation, or as accommodation in disaster areas or in emergency situations? A vision that could become reality within the next ten years. If we go one or rather ten steps further, then we are talking about **intelligent thermal** circuits using paper-based storage devices that create the precise and pleasant atmosphere within your own four walls whatever the season.

Example Mobility: Varied application areas can be found for paper in lightweight construction also on the road and in the air. The use of this **versatile material** can help in vehicle construction and to save fuel, resources and supplies. In addition, it is good for **interior panels in vehicles** on cars and motorcycles, or as **fire-resistant cardboard** inside aircraft.

A total of **640 application ideas** have been developed and investigated in the research project "Fibre and Paper 2030" (see reference). We will soon see many of them being implemented, others, however need further research. Not all of the ideas can be implemented and permanently adopted. However one thing is safe and sure: **Paper will continue to change our life** and may soon prove to be a real eye-opener.

Source: Project publication "FASER & PAPIER 2030 – Nachwachsende Zukunft gestalten".
Publisher: Papiertechnische Stiftung (PTS), Munich, http://www.faser-papier-2030.de

Source: Yamaha-Motors



Efficient duo for the press section

Atromaxx.M and Atromaxx.T

The Atromaxx family from Heimbach always offer you an efficient press felt design – irrespective of whether you produce board, packaging papers or tissue papers. A perfectly matched module combination, custom-made for your application, of Atromaxx.M or Atromaxx.T will guarantee long running performance, high dewatering and optimal paper profiles.

Atromaxx.M – multiaxial, diagonal, optimal!

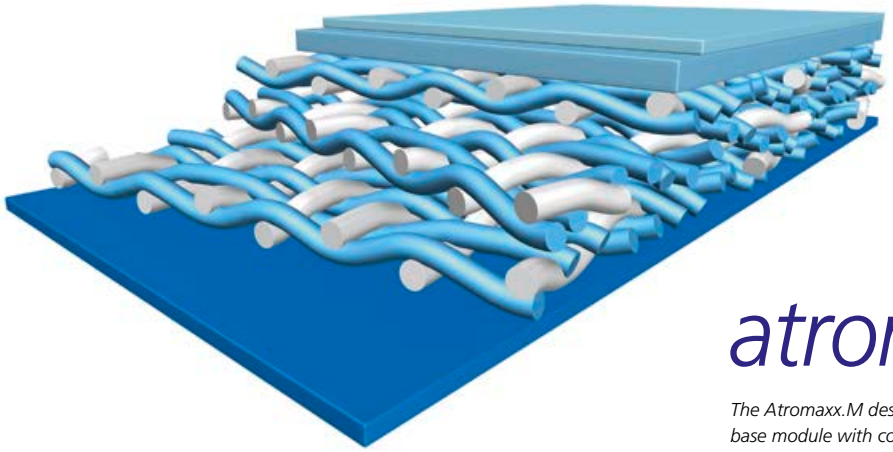
Heimbach press felt designs under the brand Atromaxx.M combine various modules from individual, relatively thick monofilaments (0.35-0.4 mm ø) with specially coarse batt modules. The big advantage of Atromaxx press felts derives from multiaxial technology: Top and bottom modules have been set up with different angles against each other. This resulting diagonal structure makes the press felt effectively incompressible and thus gives a very high void volume as well as open dewatering channels. This leads to excellent pressure uniformity and marking free paper profiles.

The packaging miracle

Atromaxx.M designs are thus ideal for the production of packaging papers: In addition to handling very high amounts of water, paper makers also struggle with impurities in the de-inked pulp, which later progressively appear as sticky contamination on the felts. Atromaxx.M in this case provides a double benefit; when the high open volume ensures the highest dewatering, the contamination can be washed out very easily through the open structure or the felt kept clean more efficiently with the help of high-pressure showers.

Flexible to use

Depending on the target position the number of combined modules can be varied: In the pick-up position three similar coarse modules between the batt layers ensure the maximum void volume and very efficient dewatering. Lighter designs with two modules are suitable for later positions where the dry content is already high enough that a lower void volume is sufficient.

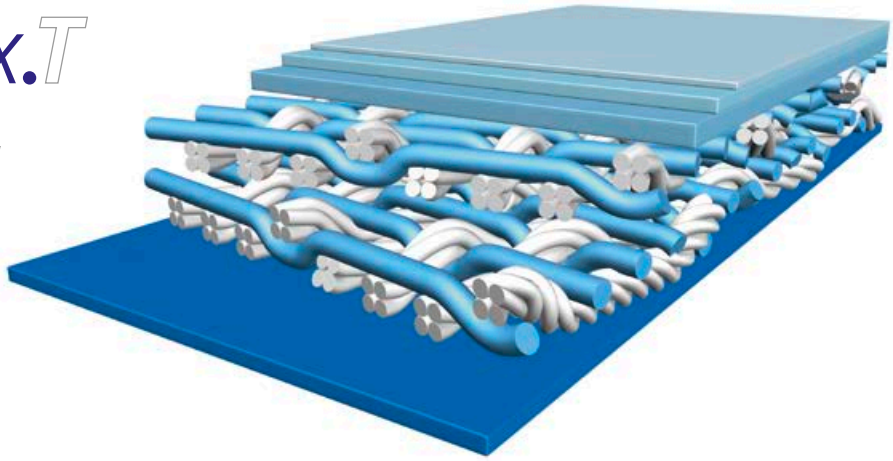


atromaxx.M

The Atromaxx.M design combines a monofilament base module with coarse batt modules – ideal for packaging.

atromaxx.T

The Atromaxx.T design – a combination of twisted modules, monofilaments and especially fine batt layers.



And in the tissue field?
Tissue production is especially challenging from the clothing point of view. Usually very low grammages (sometimes below 20 g/m²) will be made on the press felt at very high speed (above 2000 m/min). Such a thin paper web cannot be formed with coarser felt designs.

Coarser designs are simply not suitable for the production of Tissue paper: Due to the sensitive paper web and thereby low press loads the tissue felt itself has to take care of challenging amounts of water. The drying and creping takes place at the Yankee cylinder. Generally, therefore, tissue felts are relatively light having extremely fine top surface tailor-made for Tissue production.

Atromaxx.T – efficient light weight felt
The complexities of tissue manufacturing are the perfect application field for our Tissue specialist Atromaxx.T. Unlike its "coarse brother" Atromaxx.M, Atromaxx.T consists of very fine twisted modules and likewise fine batt layers. The monofilaments in the MD twists have a diameter of approximately 0.2 mm. The combination of twisted MD and monofilament CD yarns create a marking-free felt with superior fibre anchorage and compaction resistance. All Atromaxx.T designs consist of two modules. This means the felts have a weight of around 1200 g/m², up to 400 g/m² lighter than the packaging expert Atromaxx.M – a guarantor for steady life, even at high machine speeds.

Atromaxx

Your advantages

- Energy savings due to improved dewatering
- Low marking due to the homogeneous structure
- Faster start-up
- Long and reliable life times
- Tailor-made modules for every application
- Optimal pressure transfer

Success story

Paper type: Corrugated medium (125 g/m²)
Width: 7.20 m
Speed: 900 m/min
1st press: Atromaxx.M

- Faster start-up (3 instead of 7 days)
- Less breaks caused by edge breaks
- Higher speed (+30 mpm)
- Production increased by 35 t per day
- **Annual increase of profit 230,000 USD**

Finnish Ironman in Barcelona

Sales Engineer Esa Alarvo doesn't shy away from any challenge

Whether a plague of summer mosquitoes, hour-long sauna sessions or wintry iciness – the Finns can take the lot, so says the cliche. That this is not entirely unjustified is demonstrated by Esa Alarvo, Sales and Service Engineer at Heimbach Suomi Oy in Finland. The 41 year-old took part in one of the toughest triathlon competitions in the world – to become an Ironman! In an interview Esa told us how he achieved this and what this experience will mean for his professional commitment.

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Esa, on the 4th of October 2015 you took part in the Barcelona Ironman. Was that your first triathlon? What was the outcome?

Esa Alarvo
That was my first triathlon over the full Ironman distance (3.8 km swimming, 180 km cycling, 42.2 km running). My time of 11:31 h achieved my goal of under 12 hours. I am absolutely delighted with the time! I promised my family that if I achieved my goal I would have Ironman tattooed on my left wrist.

impressive
How long did it take you to prepare?

Esa Alarvo
My whole life *(laughing)*! Seriously: I started to run marathons in 2007. In the eight years up to the Ironman I have participated in 20 half marathons, four marathons and 45 cross-country skiing marathons. The competitions were held in Finland and also throughout Europe. During 2015 I followed a precisely tailored training program.

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What is your next sporting goal?

Esa Alarvo
I will compete in an internal cross-country skiing race over 50 km against my colleague Paavo Salonen in Liberec. This will be a very tough competition for both of us.

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When did you start competing in triathlons and how did you get started?

Esa Alarvo
In 2007 I bought my first heart rate monitor watch and started to train for a marathon. It was during this period that I had the first ideas about taking on the Ironman. But after my first marathon in Cologne in 2008 I quickly realised that I still needed a lot of time and training before I could realise this dream.

impressive
How do you motivate yourself for such a demanding challenge?

Esa Alarvo
My training partners and coaches are very important to me. I enjoy my time with them far more than, for example, time spent watching television.

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Have these experiences also influenced your professional life?

Esa Alarvo
Of course! I have been working at Heimbach for eleven years. From the very beginning I have striven to keep my customers happy and to develop a personal relationship with them. And sport is very good for establishing personal relationships. Many of our customers have followed my Ironman project – week after week, day after day. They have seen my results and sent me messages of congratulation. I was asked for advice on training tips and sports programs and was happy to help. Sport brings people together – and not infrequently I have met my customers in the hotel after a meeting for a fitness training session.

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Are our customers keen to participate?

Esa Alarvo

Yes, because first I ask them their sporting preferences. Then I try to arrange something that suits. I have already undertaken many different activities with our customers, and all were very impressed: Running – also orienteering, hiking, biking, cross-country skiing, slalom, snowboarding, badminton, squash, tennis, canoeing, fishing, roller skating, ice hockey … the list goes on forever!

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Does an understanding of first-class customer service help? You organize an annual "Olympics" with your customers. What's behind that?

Esa Alarvo

On a professional level naturally the highest quality, flawless products and reliable service are the absolute priority. But besides that I also strive to offer my customers something special – and combine business with pleasure. This thought gave rise to idea of the "Olympic Games".

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What is this exactly?

Esa Alarvo

Once a year I invite Heimbach customers to my house for a fun, but also sporting competition. We compete in seven sports: Rifle shooting, football, Finnish Petanque (Boule), Frisbee golf, golf, darts and javelin. Following this there is a karaoke competition and, of course, a Finnish sauna.

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Is it true that you have travelled to our customers on a snowmobile during the winter?

Esa Alarvo

Yes, I have done in the past. In some areas the snow is often more than a meter deep. In those conditions a snowmobile is the fastest way of travel. I live only 150 km from the Arctic Circle and the weather conditions are correspondingly hard. But it does not bother me; I love and enjoy extreme living!

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We know that you also have a very sporting family. Which sports do your wife and your two daughters participate in?

Esa Alarvo

My older daughter Juulia (11) has already won the Finnish Triathlon Championships twice. She is far more talented than I! She also loves gymnastics, swimming, horseback riding, skiing, track and field … Elena (8) likes gymnastics, ballet, skiing, swimming – both girls love sports, and so does my wife Mari. She swims, runs and skis. Sport is a big part of our life, and therefore our motto is: "Less TV, video and smartphones – more joint activities in sports and leisure".

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One last word on the subject of Heimbach's customers: What is important to you about them, also considering the company as a whole?

Esa Alarvo

The quality of Heimbach products has always been good, our customers know that. For me personally many customers have become friends through our joint activities. When we meet there are always issues also outside of our professional work. And I find it possible to separate the personal from the professional level.

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Esa, many thanks for the interview.

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