

# Press Release

Case study SSB fabric from Heimbach:

## Improved runnability for higher economic efficiency

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Heimbach – wherever paper is made.



GROUP

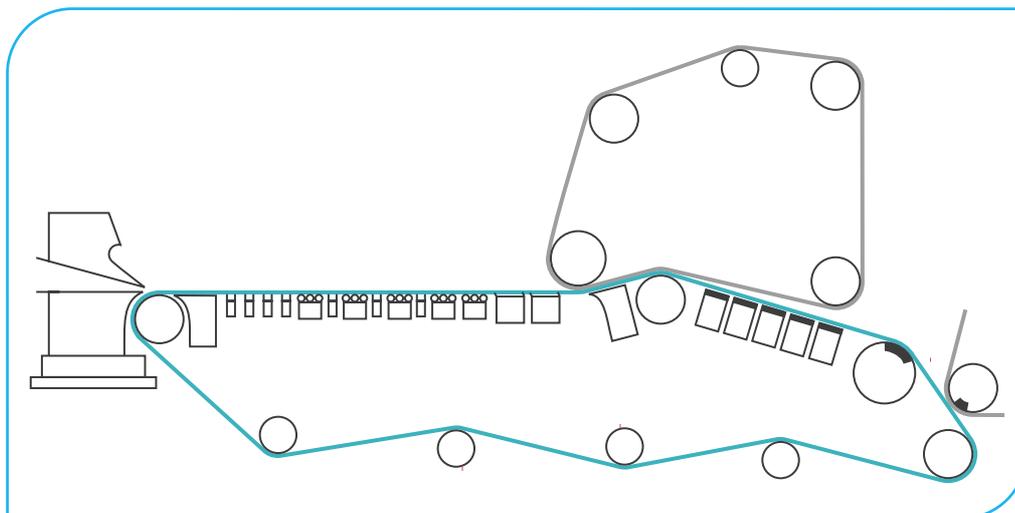


Fig.1 Valmet Symformer N

### Application on a Valmet Symformer N (Fig.1)

Paper Grade:	40-45 g/m <sup>2</sup> Newsprint from 100% DIP
Fabric Width:	9.00 m
Speed:	1415 m/min
Design:	PRIMOBOND
Life:	1600 hours – planned removal

### Previous Designs

Top:	Standard triple-layer
Bottom:	Standard 8-shaft double-layer

### Summary

By installing a PRIMOBOND in the bottom position, the customer achieved a significant reduction in the consumption of retention aids, a reduction of break rate, and a marked improvement in the printability of the sheet. In addition, the fabric reached a record life in this position.

### Installation report

The start up of the SSB fabric from Heimbach was problem-free, with full production speed being achieved very quickly.

### Retention aid: Reduced consumption

Immediately after start-up the addition rates of retention aids reduced significantly. Measurements before the installation of the Heimbach fabric,

throughout its whole life and immediately afterwards (following installation of a standard double layer fabric) confirm this reduced usage which was seen across all grammages produced (Fig.2).

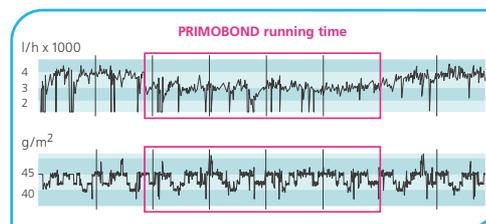


Fig.2 Retention aid consumption / basis weight

### Technical background

The SSB fabric from Heimbach (Fig.3) has a very high fibre support index (FSI) as a result of its distinctive fine paper side mesh construction. A large number of small drainage holes with short frame length provide a high drainage surface area whilst giving excellent fibre retention (Fig.4). In addition with a fine paper side surface and a more open machine side (Fig.3), the fabric cross-section is designed for a gentle, fast and high dewatering. The '24-shaft weave technology' with its 6-shaft back side creates a very open structure on the machine side of the fabric, the principle of the 'inverted funnel' (Fig.5).

Conservative calculation shows that an average retention aid saving of 150 g/t was achieved across

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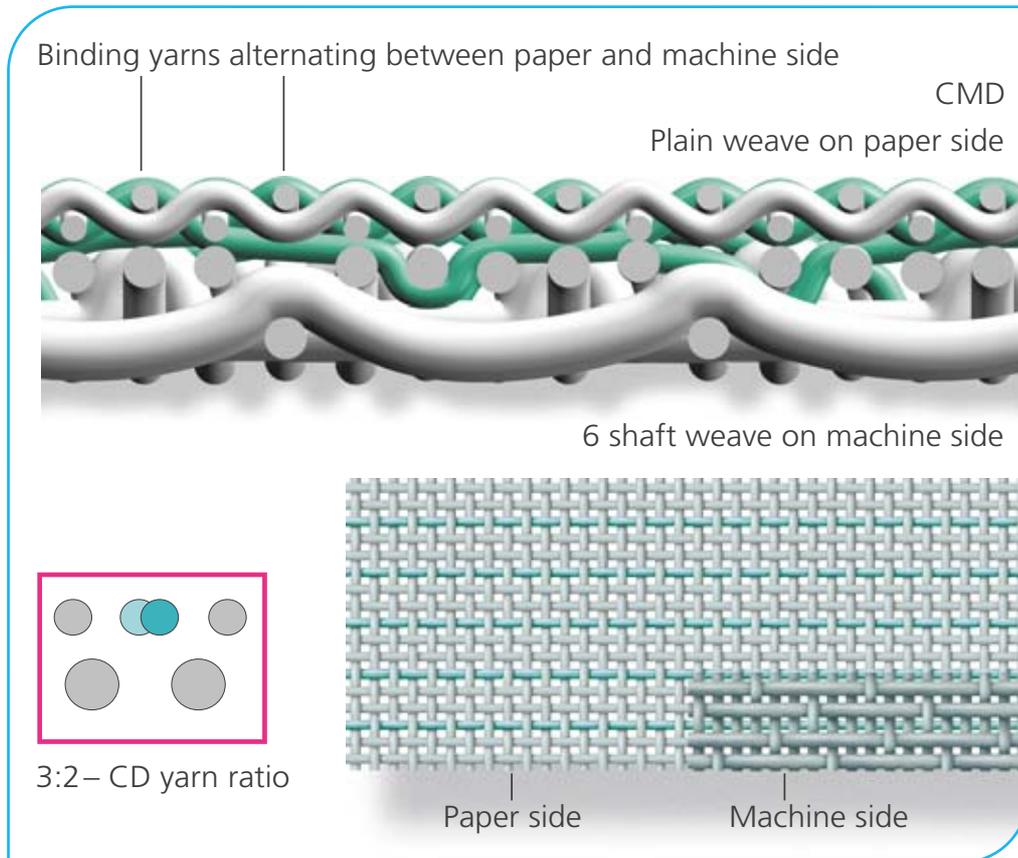


Fig.3 PRIMOBOND from Heimbach

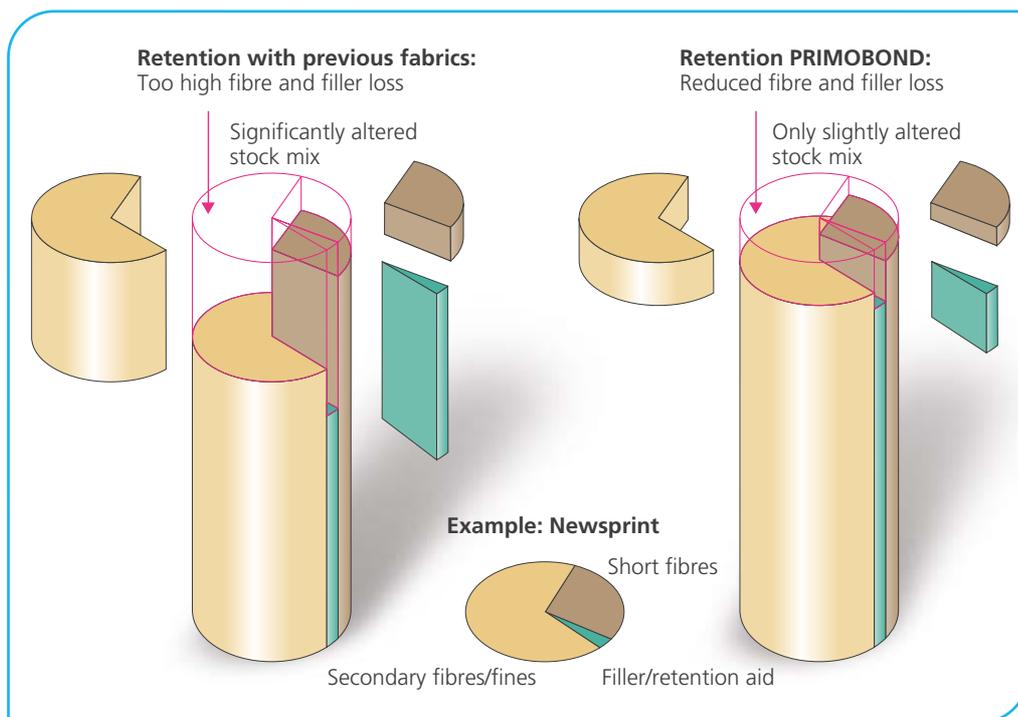


Fig.4 Explanatory comparison: Retention

all basis weights produced here. On the assumption that the machine produces 30 t/h, this means a reduction in retention aid usage of 4.5 kg/h.

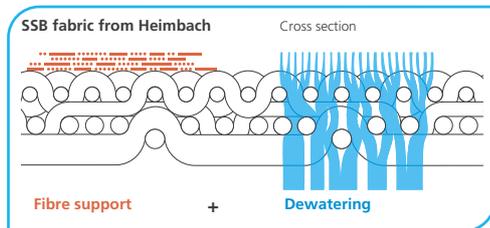


Fig.5 Principle of the "inverted funnel"

### Financial saving over the life time of the Heimbach fabric

This reduction in retention aid, due to the PRIMOBOND fabric, when quantified as a financial saving to the customer over the total fabric life, would look as follows:

The fabric ran for 67 days, approx. 1600 hours.

Reduced retention aid cost per hour

(4.5 kg/h x EUR 1.50 estimated cost) = EUR 6.75/h

**Total cost saving:** (1600 hours x EUR 6.75)

**= EUR 10,800.-**

**Retention aid saving = 7200 kg**

### Breaks: Significantly reduced

In parallel to the above retention aid saving, the Heimbach fabric provided a reduction in the break rate throughout its whole life. Compared to the break rate when running standard double-layer fabrics before and after the SSB fabric from Heimbach, the latter led to an average reduction in the break rate of approx. 20%. Please see Fig.6 showing the downtime before, during and after the installation of the Heimbach fabric.

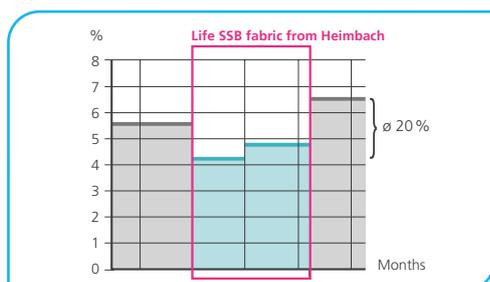


Fig.6 Fewer breaks: Reduction in downtime

### Technical background

The reasons for this exceptional performance are provided by the unique characteristics of the fabric, which give the following benefits:

- Optimal diagonal and CD stability preventing virtually almost all width shrinkage as well as all distortion (Fig.7)
- Even moisture profiles (reduced 2-Sigma-values)
- Controlled dewatering pressure
- High fibre retention
- Excellent sheet formation

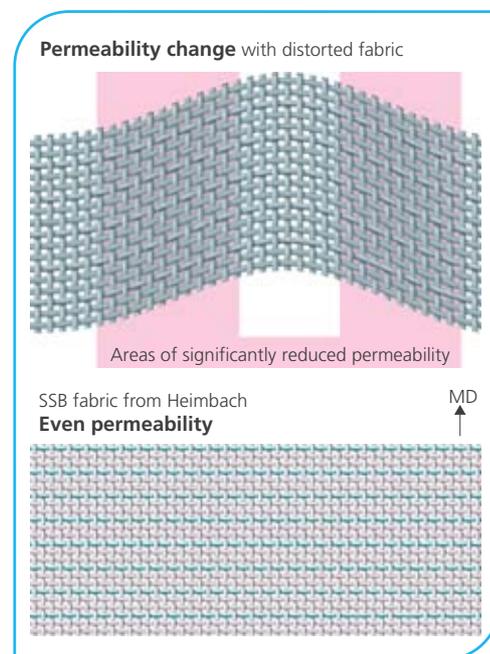


Fig.7 Explanatory comparison:  
Dimensional behaviour

Only the '24-shaft weave' from Heimbach permits a 6-shaft weave on the machine side (Fig.8). This creates a construction of outstanding stability.

In total, the well-balanced dewatering related to the equal, fine mesh fabric surface, the reliable running properties with a minimum of distortion and the straight, even CD profile contribute significantly to the structural homogeneity of the paper sheet.

The 'Added value' achieved by the reduction in downtime due to PRIMOBOND will be obvious to every papermaker.

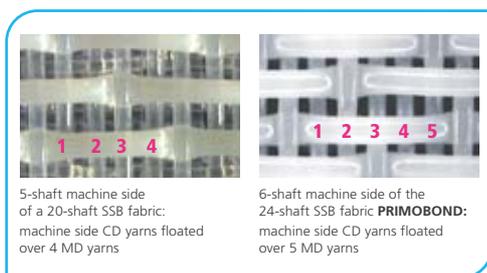


Fig.8 Comparison: Float length machine side

### Paper quality: Reduced porosity, improved printability

In addition to the above benefits following the installation of the fabric from Heimbach, further 'Added value' was established through improved paper quality. The paper porosity trend profile in ml/min [Bendtsen] (Fig.9) shows that immediately after the start up of the Heimbach fabric a significant reduction in the sheet porosity level occurred.

This low level was maintained throughout the whole life time, only to increase again on subsequent installation of the standard double layer fabric. In addition there was a noticeable reduction in the 'pinholes' associated with the lighter basis weights.

### Technical background

The plain weave fine mesh paper side of the Heimbach SSB fabric (Fig.10) leads to a highly gentle and even sheet dewatering. This is another instance where the combination of several characteristics of the fabric are working together for a significant reduction in drainage marking and wire marking (Fig.11), together with an increased homogeneity in the formation.

Through laboratory analysis at Heimbach UK the improvement in paper quality could be quantified. The quality improvement in terms of better printability becomes evident when comparing the results of print simulations on paper from standard fabrics and those on paper from PRIMOBOND (Fig.12).

Additionally the customer praised the significant reduction in streakiness which was clearly visible both at the forming board and in the finished sheet.

### Wear: Record life, and more...

With 1600 hours the SSB fabric from Heimbach achieved an absolute life time record in this position.



Fig.9 Paper Porosity

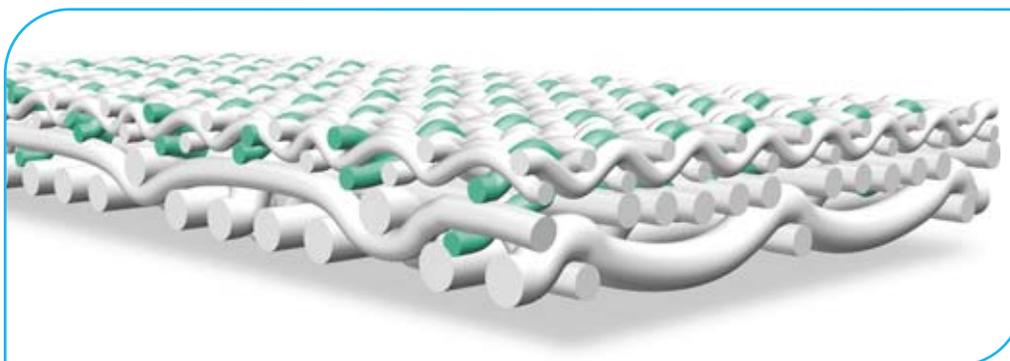


Fig.10 Fabric surface paper side

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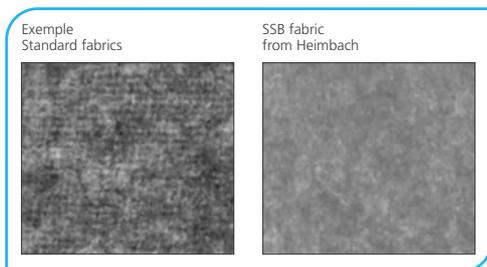


Fig.11 Explanatory comparison: Wire making

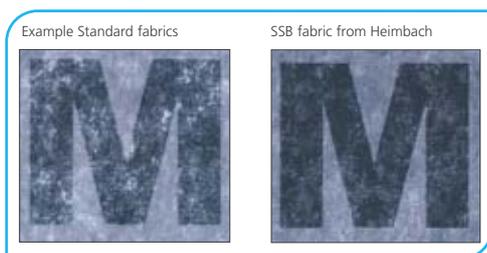


Fig.12 Explanatory comparison:  
Print simulation

Furthermore laboratory examination of the used fabric showed more than 50% wear volume remaining (Fig.13). This suggests a possible fabric life of 15 weeks plus, rather than the planned removal after 9 1/2 weeks as yet.

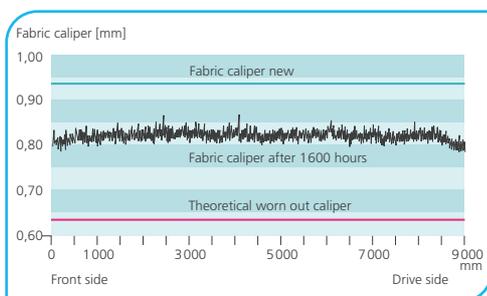


Fig.13 Fabric caliper development:  
SSB fabric from Heimbach

## Technical background

This life time record is attributable to the typical Heimbach SSB fabric construction of the machine side:

- 6-shaft weave on the machine side (only possible with the 24-shaft weave technology) = increased float length of machine side CD yarns
- plus high CD yarn caliper
- plus great burial of machine side MD yarns (Fig.14, 15 and 8)

In this way an increase in the wear volume from approx. 40 cm<sup>3</sup>/m<sup>2</sup> with previous standard fabrics, up to approx. 90 cm<sup>3</sup>/m<sup>2</sup> with the fabric from Heimbach is achieved. In summary, the combination of the above fabric performance characteristics leads to this significant process advantage.

**Translated into a whole year's use of PRIMOBOND this would mean a reduction from 7 to 4 fabrics annually – plus the time savings from 3 fabric installations.**

## Energy: Reduced consumption

With the reduction of drive energy from the previous 900-1000 A – depending on basis weight and speed – to only 850-900 A during the whole period of its installation the SSB fabric from Heimbach brought the customer a further financial 'Added value'.

## Summary

The demands of the papermaker are: "Increased fibre support index combined with maximum dewatering plus a high wear volume – all in one fabric". Heimbach has fulfilled these demands with PRIMOBOND, worldwide the first SSB-Fabric in the '24-shaft weave technology' with 6-shaft weave on the machine side combined with the 'Intrinsic Weft Concept'. So far this is the well-qualified technology for delivering the improved fabric performance expressed in the papermaker's demands.

In summary, this case study proves that the system advantages promoted by Heimbach can be translated efficiently into quantifiable 'Added value' in paper production.

## Benefits to the customer in annual production budget\*

Based on a 100% supply of SSB fabrics from Heimbach to the bottom position instead of standard double-layer fabrics, the projected savings could be as follows:

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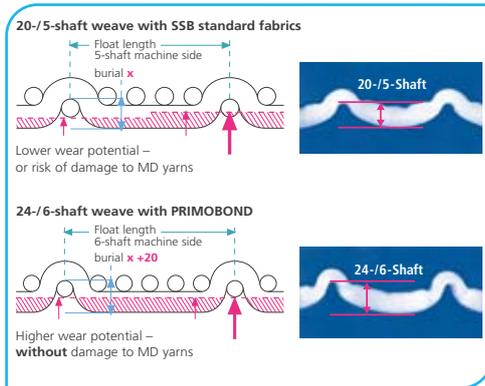


Fig.14 Comparison: Wear potential

\* The calculation being based on the following:

- 1 Year machine operation represents 8100 operating hours
- 1 kg retention aid costs approx. EUR 1.50 (guide price)
- 1 hour downtime costs approx. EUR 9,000.-
- 1 fabric change takes approx. 4 hours
- 1 double-layer standard fabric runs av. 7-8 weeks, i.e. 7 fabrics per year required
- 1 PRIMOBOND fabric runs av. 15 weeks, i.e. 4 Heimbach fabrics per year required

## Cost reduction / year

	Standard	PRIMOBOND
• Number of forming fabrics consumed	7	4
• Fabric changes	7	4
• Total costs fabrics + fabric changes	EUR 598,000.-	EUR 386,000.-
• <b>Saving</b>		<b>EUR 212,000.-</b>
• Retention aid saving:		
EUR 6.75 x 8100 operating hours		EUR 54,675.-
• Total saving / year, about		EUR 266,675.-

...and additional savings from reduction in the break rate and reduction in energy consumption

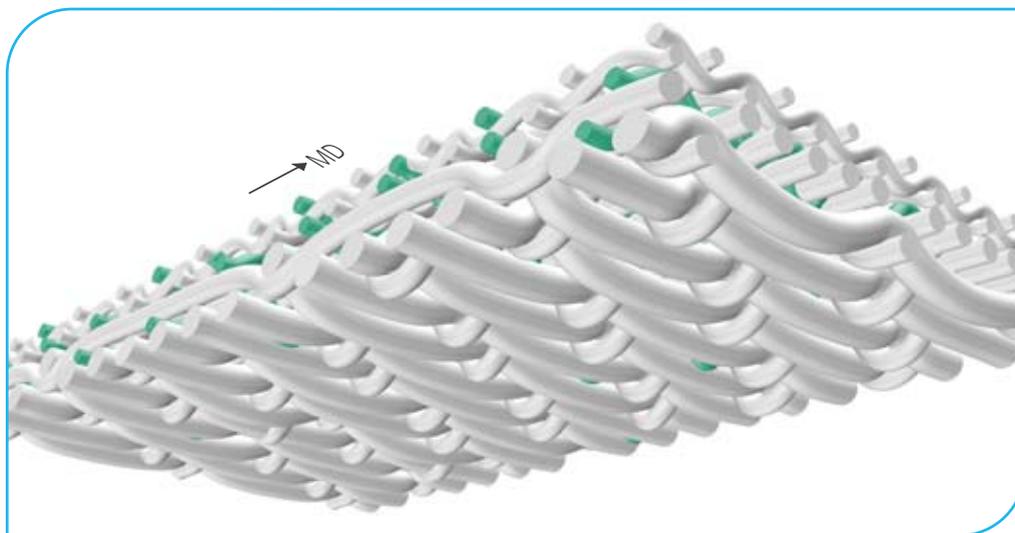


Fig.15 PRIMOBOND: 6-shaft weave machine side