

# Low wear rates improve forming fabric life

A new range of longer-life forming fabrics continues to be developed at Heimbach using the single binder yarn concept. PPL reports



**C**ontinuous improvement is a part of daily business in today's manufacturing

industry. 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

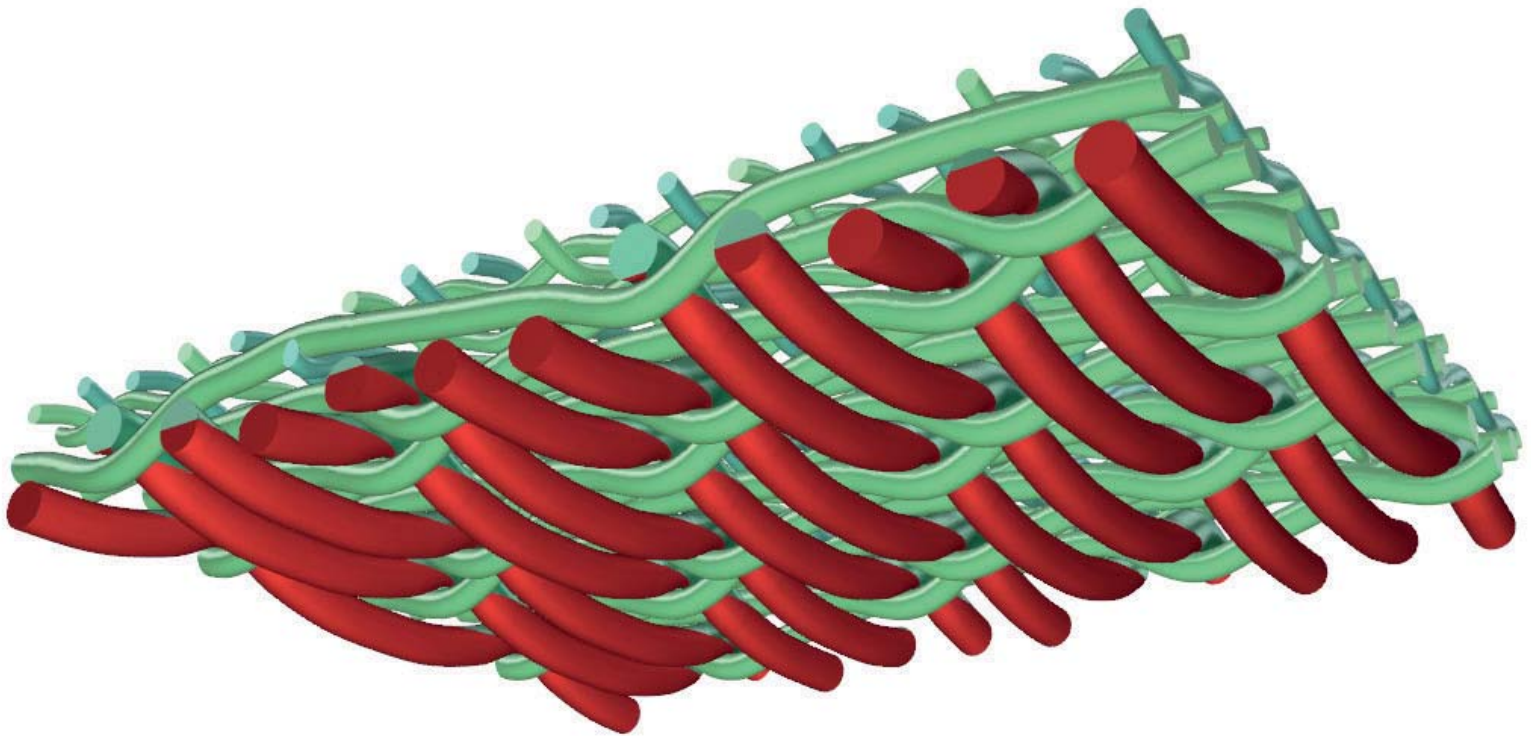
Germany-based Heimbach is fully committed to introducing innovations that cater for these changing requirements. The most recent example is the development of the first woven SSB forming fabrics to use single binder yarn technology in place of the paired binders used in conventional SSB designs throughout the industry.

From the 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 part of Heimbach's product line and are in common use across Europe and Asia.

With a glance at the past, Heimbach's track record in bringing major technology shifts to the market – benefitting the

industry as a whole – is good. In the late 1990s they 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.



**Figure 1: The volume of red material is representative of the available wear volume**

**Adaptation for packaging grades**

Back to the present, Heimbach continues to explore new ways to save costs for its customers. Experience with Primoselect on graphic paper applications gave 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 Heimbach began in 2014 to explore a range of products utilising the novel 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, Heimbach has a forming fabric perfectly adapted to the demands of the packaging market.

Hamish Parsons, Strategic Product Manager for Forming at Heimbach, explains: “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.”

**Lifetime in focus**

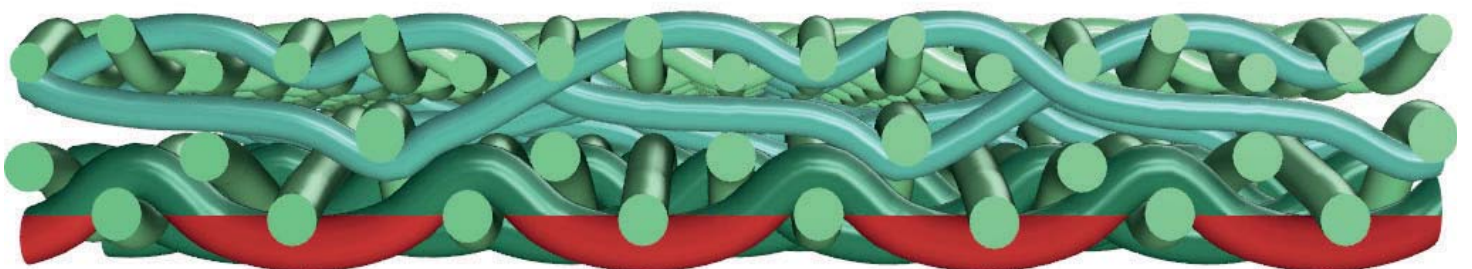
In recent months Heimbach has focused on further expansion of the product line to enable fluting and liner producers to benefit from the competitive edge provided by Primoselect. Here the primary focus will always be life potential with the aim to reduce machine downtime.

At this point it is worth taking a look at how measurements and assessments of life potential are done at Heimbach.

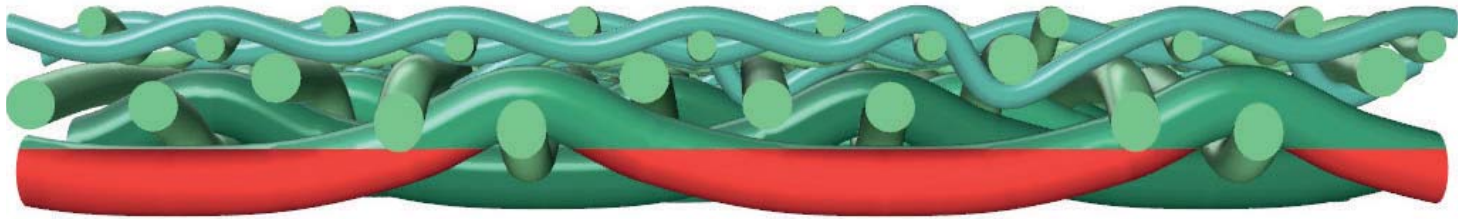
**How to quantify wear volume**

In order to understand this most critical subject it’s best to look at the material content that is available to be worn away over the life of the fabric. This is illustrated above with the critical yarns coloured in red (Figure 1). 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, Heimbach uses an optimised combination of polyester and polyamide, the materials most



**Figure 2.1: Four-shaft machine side – lowest wear volume (used in tissue)**



**Figure 2.2: Six-shaft machine side – increased wear volume (standard)**

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 Heimbach is able to compare one design against another very easily. On data sheets a calculation in cubic centimetres per square metre (cm<sup>3</sup>/m<sup>2</sup>) of wear volume is always provided 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 the volume of red yarn in Figure 2.1 is studied it can be seen that the volume of material available to resist abrasion in the four-shaft machine side pattern is very small.

Extending the distance between locking points by moving to a six-shaft configuration (Figure 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 (Figure 2.3).

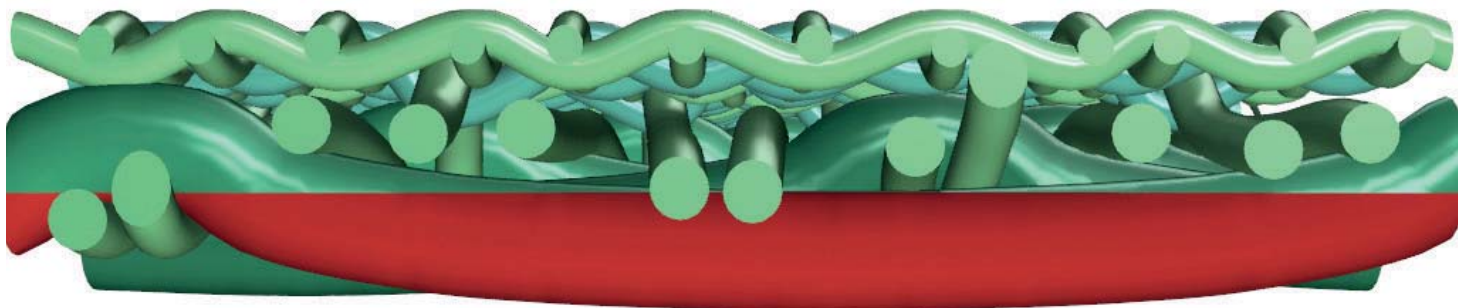
**The secret is in the long float**

The latest Primoselect forming fabrics incorporate this new 12-shaft machine side configuration, and show life improvements up to 30 per cent more than alternative standard designs. Heimbach achieves this extra wear resistance potential by using a combination of the unique weave pattern and the machine-

side cross direction yarns with a diameter range of 0.35mm to 0.5mm (see Figure 3).

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

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**Figure 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 <sup>2</sup>	FSI	Caliper (mm)	Air Perm (cfm)	Wear Volume (cm <sup>3</sup> /cm <sup>2</sup> )
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	1.4	370	153
F	22 x 20	0.20/0.27 : 0.20/0.50	455	106	1.4	410	144
G	22 x 18	0.20/0.27 : 0.20/0.50	428	102	1.4	450	136

**Figure 3: Technical information on several high-life Primoselect designs**