

Clean from the start

Why forming section cleaning is so important

Dear Papermakers!

I recently got hold of a document that had been printed using a process known as "Letterpress", which, as you know, is a very old printing method. Deep embossing can certainly create beautiful results. Here both look and feel are combined. Only paper can make this possible! However, before you are able to sell a high-value end product a key factor would be the best and most efficient production possible. This is why we are today taking up one of your questions: How to reduce or even avoid sheet breaks. Quite often this involves the topic of "former hygiene".



Photo 1: Unfortunately not uncommon in forming sections ...



Photo 2: ... contamination and deposits.

We use this term to describe cleanliness in the forming section – a very important area. My colleagues and I have devoted some time to examine several forming sections in great detail in order to illustrate opportunities for increased productivity. And this, of course, occurs **right at the beginning** of the process, since many key paper characteristics are already set in the forming section. Bearing this in mind, we **must take the utmost care with cleanliness** in this area.

Complex forming sections

Only recently I was on the road with my colleague Hamish Parsons (Strategic Product Manager Forming) in order to dive into a "wet end" once again. What we saw is illustrated in photos 1-3. You could almost say that it would not be possible to have more contamination. As is the case with virtually every machine, the forming section shown has a complex and intricate construction. Impurities can therefore build up **on numerous machine components**, principally caused by water and fibre carrying.

Cleanliness is everything

Deposits such as this are toxic for papermaking since, in addition to a reduction in product quality, runnability problems and sheet breaks are often the result. As **experience with customers** worldwide has shown, this is mainly due to inadequate cleaning of forming fabrics, rolls, and doctors. Of course, it must be said that contaminated edges or a suboptimal and unsuitable forming fabric design can also cause these problems. When producing paper which is changed by further processing into artistically accomplished brochures by advertising agencies, for example, **cleanliness is a top priority**. However, this can only be achieved if we take great care with former hygiene.

Happy customers

In the final count, the result of your daily successes is: paper of the highest quality, made in the most efficient way possible, and available at short notice! In total, quite simply **high customer satisfaction**, including hopefully one or other of your key customers serving advertising agencies. "Quality always wins out", as customers say, whilst, after all: **"Art requires skill"**. Indeed, mastering the art of papermaking is "only" half the battle as machine clothing has to do the rest in harmony with the machine.



Photo 3: Fine particles near the edges.



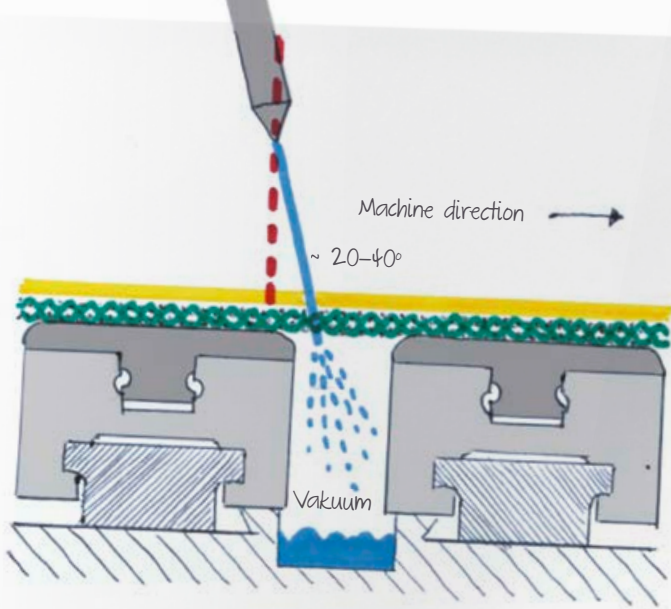


Fig. 1: Optimal water jet in machine direction.

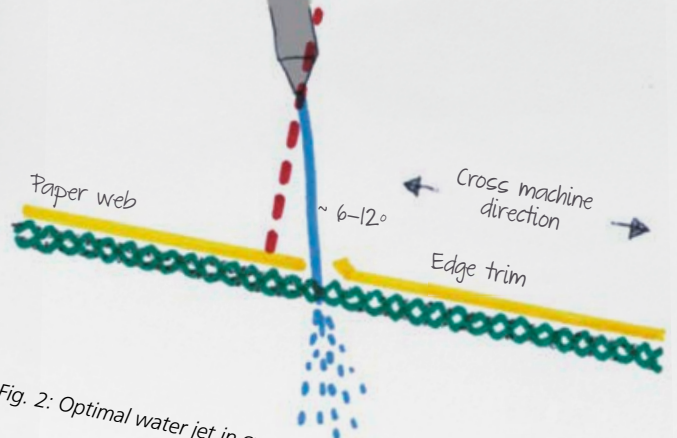


Fig. 2: Optimal water jet in cross machine direction.

Persuasive figures

It is not difficult to work out what happens when production has to be interrupted, as Hamish says: The loss of annual turnover is **more than 1.8 million Euros/year with just one single sheet break per day** (board machine: test liner, 100g/m², 7m wide, 1,000 m/min.). A considerable amount! Since we have seen time after time on our various assignments that **fibre or slime deposits can be the cause of breaks – especially in the forming section** – our belief is that these should never be ignored.

Conditioning a significant factor

Conditioning is also a critical factor. **If this does not meet the requirements of the process, the result will be poor.** High water quality, the correct filtration units, precise water pressure and perfectly adjusted nozzles – this is the way to achieve optimal production in the forming

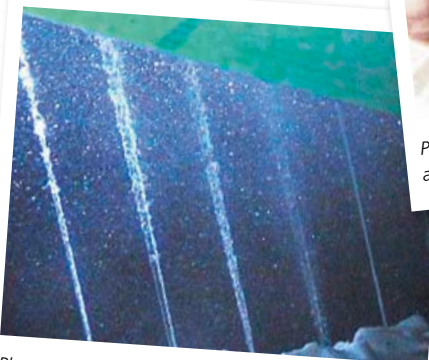


Photo 4: Defective nozzles lead to turbulent water jet.

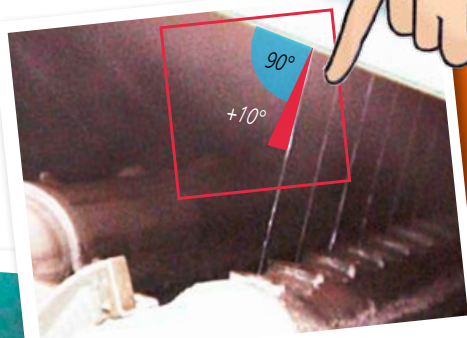


Photo 5: This is the right way – laminar water jet at an angle of 100°.

section! In photos 4 and 5 you can clearly see the difference between a turbulent jet (Photo 4) and the **correct laminar alternative**. When a water jet is turbulent the predominant cause is defective nozzles and they should be replaced – because efficient cleaning **can only be achieved with the correct jet!** In order for the laminar jet to be able to clean effectively, the nozzles should be adjusted with a 90-100° angle towards the fabric and should work at the right distance (Photo 5).

Result: perfect fabric conditioning – and the highest possible cleanliness.

Position of edge trim nozzles

Equally important is the positioning of the edge trim nozzles, where possible situated above the last slot of the high-vacuum suction zone. If edge trim nozzles are to work perfectly, key parameters are **correct size, appropriate diameter and flawless functionality**. Figures 1 and 2 make clear what's crucial: **Correct nozzle adjustment together with appropriate angles**, and the correct position of the "twin nozzle". Its tilt must be observed, the angle towards both machine and cross machine directions. →



Fabric design makes a difference

The right choice of forming fabric also plays an important role in forming section hygiene. To this end Heimbach has developed the Primoselect design which is **being quickly adopted across all markets and grades**. It has numerous benefits, primarily due to its open structure (fig. 3). The much **lower density ensures optimal dewatering**, even when a reduced vacuum is applied, and the low void volume reduces water and fibre carrying (fig. 4). The result: A fabric that runs noticeably cleaner than conventional multi-layer forming fabrics (Photos 6-8).

is determined individually and by our customers themselves. Just as you like it, so to speak. The principle of Primoselect is clear in our slogan: You decide which benefit is your priority. **Together we will choose the best solution for you.** As always with the aim of producing the best paper – for this, too, really is an art!

Your Paper Pete



Fig. 3: Unique binding concept.

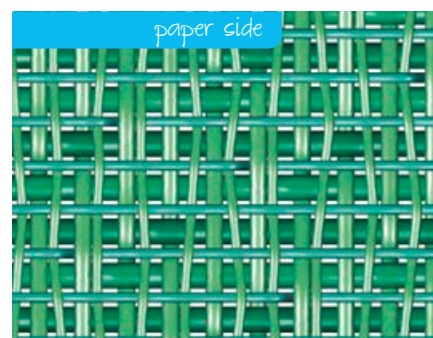


Fig. 4: Very low void volume.

Together we choose the best

Our colleague Hamish still retains fond memories of the times when Heimbach development engineers, together with application and machine experts, considered the question how, in the forming section, **we could offer our customers more and better solutions – and higher satisfaction**. The result: Primoselect, whose specific design



Photo 6: Primoselect (right) next to two conventional multi-layer forming fabrics – minimal fibre carry



Photo 7: Water carry with normal multi-layer forming fabric.



Photo 8: Negligible water carry with Primoselect.