

„If You Can't Measure It, You Can't Manage It"

Process control makes success truly possible

Bookkeepers have been setting the pace in production for quite some time. Decisions based on "gut-level feeling" are not only outdated but even dangerous for the future of a company. More than ever before, economic and successful actions are based on figures, data, facts.

The individual processes of the textile value adding chain are already complex enough. Add to this that the processes inside a washing compartment or stenter are not easily accessible. The individual processes appear like a "black box" best handled with a generous safety margin. However, this safety margin is the biggest enemy of production because it acts in the hidden and only promises benefits at first sight. After all, the product is only properly dried or truly clean when continuing at somewhat reduced speed. But what is "right" or "wrong" in textile production?

Management by numbers

Any process in textile finishing is based on physical and chemical principles. They can simply be verified at the laboratory and finally transferred to production. To be able to accompany this process successfully, capturing the success or deviation numerically and constantly controlling it is indispensable. In addition, today's suppliers (both internally and externally) increasingly want to have the results achieved logged and transmitted continuously.

This is where Mahlo process control comes to leverage: Using a multitude of sensors, all relevant processes around the stenter are recorded and corrected in real-time. A popular example is the moisture control after the stenter where the speed of the product is adapted to the drying result. The stenter – usually the bottleneck in wet finishing – thus always runs at process-optimized speed and is utilised effectively in regard to the results.

In addition to residual moisture control, the German machine builder offers control of the exhaust air moisture and dwell time with fixing processes in the stenter. The latest offspring of the family of the Bavarian think tank now also takes a close look at the weight of the produced web. The developers have resorted here to another proprietary innovation: Online measurement of the number of weft threads and course count.



Fig. 1: Famacont PMC_Fadenzahl_Kamerakopf

Famacont: Synonym for continuity

The non-contacting method for thickness measurement of stenters, shrinking and compacting equipment has been used already for decades. Especially knits manufacturers like to use continuous measurement and control of their product in order to obtain a constant weight at the end of the process. In the course of production the knitwear is exposed to significant mechanical impact resulting in lengthening and thus reduced square metre weight. Because knitwear is sold by weight, the end product must be adapted to the specifications. Thanks to the over-feed during the drying stage, exactly these specifications are mapped in a reproducible manner. The sensor at the infeed measures the density of the courses and compares it with the specification, which may be stored, for example, in recipe data management. Accordingly, the computer sends a signal to the over-feed roller which regulates the pinning process onto the stenter chain. With the help of the feed-forward control algorithm, the resulting distortion is compensated for in the best possible way. A further sensor at the outlet checks the result and records the measured values in suitable protocols. This closed control loop with auto correction offers outstanding reliability with fluctuating grammages and prevents individual parties from having to run a second time with higher over-feed through the stenter. This not only saves water, chemicals and energy but especially opens up the stenter bottleneck for originally provided parties. A clear win for overall efficiency

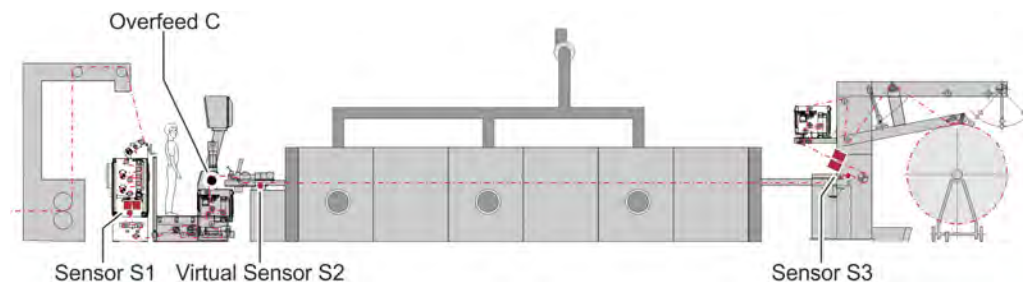


Fig. 2: Famacont PMC Feed Forward Principle

The best technologies for specific tasks

While the front sensor solely measures the individual density of the courses or also weft threads and forwards them as basis for over-feed to the stenter, the rear sensor even assumes two tasks: 1st Determination of a correction factor for the control moment 2nd Continuous reporting (for statistics / supplier evaluation)

The bright-dark modulation of the proven optoelectronic Mahlo scanners constitutes the best technique for density measurement at the infeed. No system serves a broader spectrum of different products. At the outfeed, the analysis has a different objective. The sensor generation features the latest state-of-the-art technology here. High-resolution optics produce 10 images per second to capture each detail of the product web. The special FFT software analyses the images with precision and, in addition, allows determining the weight of the product directly. The benefit for the user: Verification at any time whether the product corresponds to the weight specifications. A constant stop of the machine for taking laboratory samples as well as a cut product is dispensed with.

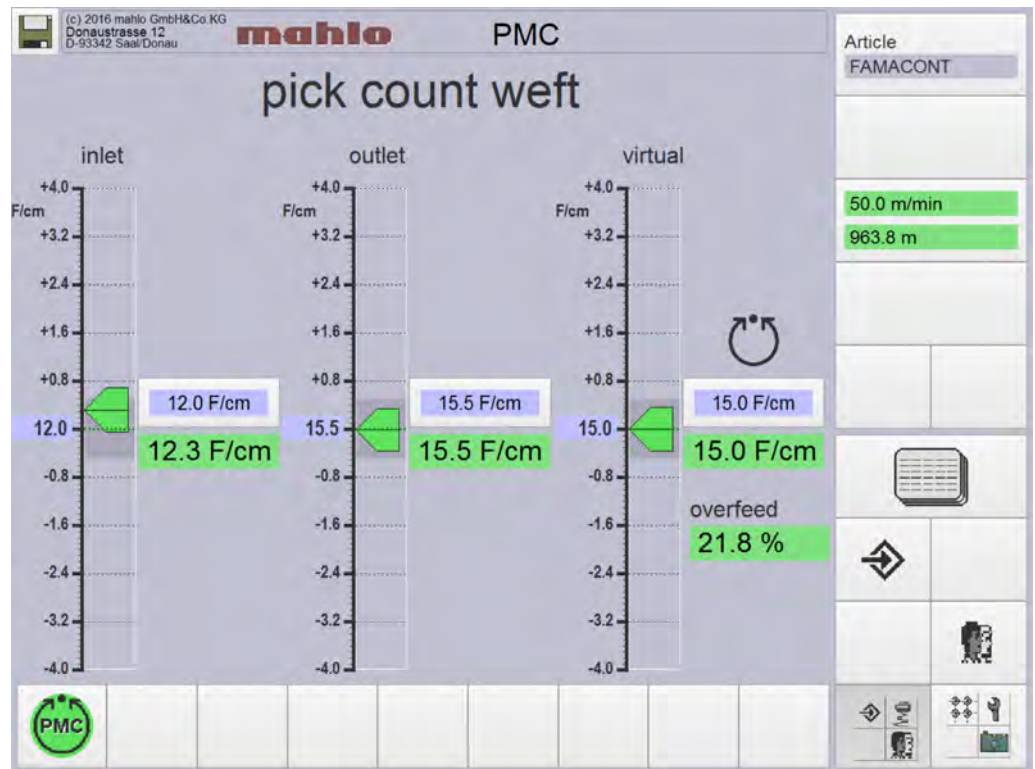


Fig. 3: PMC_SW_Hauptseite_Schussfadenzahl_Werte page

Industrie 4.0 secures a perfect combination

With its new G15 machine generation Mahlo combines the demands for connectivity and optimisation: apart from various control loops for improving the production results, the results can be coupled via an OPC UA interface to networks or included in statistics. In addition, the machine builder from Bavaria offers the option of completely customizing the display to the needs of the machine operator. This does not only enhance handling of the control display but also increases the affinity to the machine – after all, the modern user navigation of the Mahlo products features a strong similarity to common smartphones.

Summary

Quality, efficiency and profit can be increased with optimal process control. However, this is not the only benefit: in times of increased tension in the relationship between customers and suppliers, exact documentation of the process data always also represents an insurance against unjustified complaints or downgrading product critique. Furthermore, the qualitative standards that have been achieved with the Mahlo technology can also be made available immediately to partner companies. They are then able to achieve the same quality because of this configuration, regardless of where they are located on the globe. This saves time at the lab and moves the networked companies even closer toward 100% 'Right First Time'. The new generation of the Famacont delivers an invaluable contribution at this by constantly regulating the product density and reliably logging the weight across the entire production flow. In the same way a clear competitive advantage can be gained with the process control from Mahlo.