

Success Story OnEfficiency.Strength

Voith Paper

Mailing address:

J.M. Voith SE & Co. KG
Global Communications Voith Paper
St. Poeltener Strasse 43
89522 Heidenheim, Germany
Tel. +49 7321 37-2077

www.voith.com

How Laakirchen Papier AG optimizes the papermaking process with OnEfficiency.Strength

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Current raw material prices are forcing paper manufacturers to reduce production costs and further optimize the efficiency of their production facilities. Digitalization plays a key role in achieving efficiency gains and cutting costs. This is because new technologies in particular enable significant improvements in existing and new plants. They allow better monitoring of all processes and thus more precise production control, which in turn leads to higher efficiency and better availability.

Reduced starch consumption

In addition to fiber, starch is a major raw material cost factor in the production of packaging papers. Therefore, the goal of paper manufacturers is to reduce starch application and keep the amount of starch as low as possible – without falling below the required quality level. However, continuous optimization with conventional tools quickly reaches its limits. Paper manufacturers are confronted with the situation that they cannot directly control important quality parameters such as strength, because the measurement of the relevant parameters only takes place at the end of each tambour in the laboratory and the values are not continuously available.

Digital solutions such as OnEfficiency.Strength from Voith now offer the ability to have important quality parameters constantly available thanks to virtual sensors and to have the process optimally controlled automatically.

How Laakirchen Papier AG optimizes the use of starch

Since 2021, OnEfficiency.Strength has been used at PM 10 in Laakirchen, Austria, to optimize starch application. A positive side effect is also the resulting reduction in steam consumption in the after-dryer section.

What was previously only possible either through manual measurements in the laboratory or automatic test line measurements is now realized by Laakirchen with the use of virtual sensors: the calculation of data on the most important strength values (SCT CD, CMT and burst).

"This continuous monitoring of important quality parameters enables continuous optimization of the process in terms of cost and quality. Manual laboratory measurements, on the other hand, take up to 30 minutes after sampling, and the parameters can then only be adjusted by manual intervention," says Korbinian Hitthaler, project manager for Papermaking 4.0 at Voith OnPerformance.Lab. "Thanks to the virtual sensors, the strength values are now available in real time, so the starch application can be controlled without losing time. Thanks to the automatic control of the jet-wire difference, strength potentials between MD and CD can be optimally balanced."

Christopher Dierkes-Leifeld, PM 10 technologist at Laakirchen Papier AG, further explains: "We have been using OnEfficiency.Strength since 2021 to consistently meet quality requirements and thus optimize the paper produced on PM 10 and compensate for process fluctuations. At the same time, we have also reduced our costs, because OnEfficiency.Strength enables optimum control of the starch application quantity and the jet-wire ratio."

Real-time prediction of quality parameters and continuous optimization of the process has not only prevented quality fluctuations, but OnEfficiency.Strength has also enabled production costs to be reduced while reliably meeting quality targets. "Since we started with Papermaking 4.0 in cooperation with Voith, the speed of our PM 10 has been increased. Nevertheless, we have achieved the strength properties required by our customers with up to 10 percent starch savings due to optimization by the control system," concludes Dierkes-Leifeld. For PM 10, OnEfficiency.Strength helped to save four percent starch in the first year and now up to 10 percent starch in the second year, while key quality parameters such as SCT CD and CMT remained within target values.

The OnEfficiency.Strength principle: visualize, stabilize, optimize

OnEfficiency.Strength combines three modules to create a new, powerful generation of advanced process controls (APC). The control system includes virtual sensors, also called soft sensors; model predictive control (MPC); and a cost optimizer. A special feature of the virtual and self-adaptive sensors is their high predictive accuracy, typically above 90 percent.

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The virtual sensors precisely predict important quality parameters. Knowing these parameters in real time enables the MPC to control the papermaking process in such a way that the targeted values are permanently achieved through continuous adjustment. The cost optimizer ensures that this is done at the lowest possible cost. To find the customer-specific cost optimum, actuators and control strategies can be individually selected and flexibly adapted.

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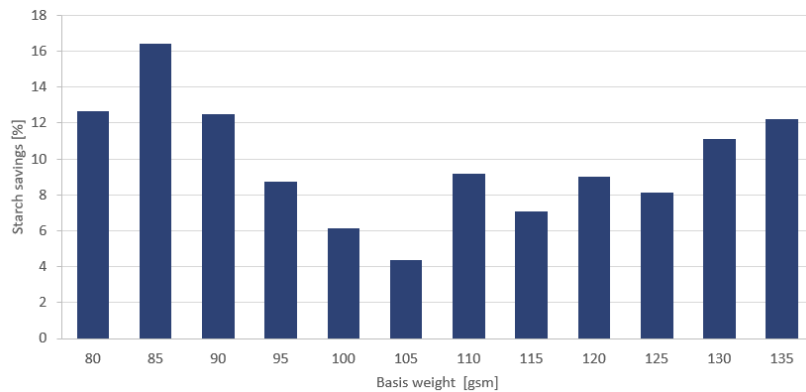
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Laakirchen Papier AG was particularly impressed with the high savings potential offered by OnEfficiency.Strength. This was calculated in the Value-Add Assessment carried out in advance. "Before installation, we carry out a so-called Value-Add Assessment with our customers, in which we calculate the savings potential of OnEfficiency.Strength based on the individual customer data," says Dr. Julius Flitsch, head of the Voith OnPerformance.Lab. "We then guarantee this savings potential to our customer. In addition, we always determine the parameters and actuators to be controlled individually, depending on customer requirements and paper machine."

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Laakirchen Papier AG and Voith: Lighthouse project in Papermaking 4.0

Laakirchen Papier and Voith have been working on joint pilot projects in Papermaking 4.0 since 2019. "We've had very good experience working with Voith. In addition to the OnEfficiency.Strength project, we also have many other Papermaking 4.0 pilot projects being implemented at the site. These include OnEfficiency.BreakProtect, OnCumulus and most recently OnView.Energy. This enables us to continuously improve our papermaking process," says Jan Reibert, Production Manager PM 10 at Laakirchen Papier AG. "Our cooperation with Voith is always at a very high level and on an equal footing. During the OnEfficiency.Strength project phase, we were in close and intensive exchange. This enabled us to discuss potential challenges together, discuss appropriate solutions and implement them in a timely manner."



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Starch consumption of Laakirchen Papier AG's PM 10 in percentage over the grade spectrum. On average, starch savings of 10 percent are achieved.



With the help of OnEfficiency.Strength, Laakirchen Papier AG can stabilize quality fluctuations and reduce costs.

Contact

Anja Matuschka
Global Communication Manager Voith Paper
Tel. +49 7321 37 2077
Anja.Matuschka@voith.com