

Data-Enhanced Chemistry Control and Optimization at a Nordic Kraft Pulp Mill

Brown stock washing is a key process to consider in evaluating pulp mill efficiency and cost-effectiveness, as it significantly affects the rest of the operation. Optimizing the washing process can decrease the load on the evaporation plant and reduce the need for bleaching chemicals, which leads to cleaner effluent. Overall, this helps to stabilize pulp quality and keeps unit costs low.

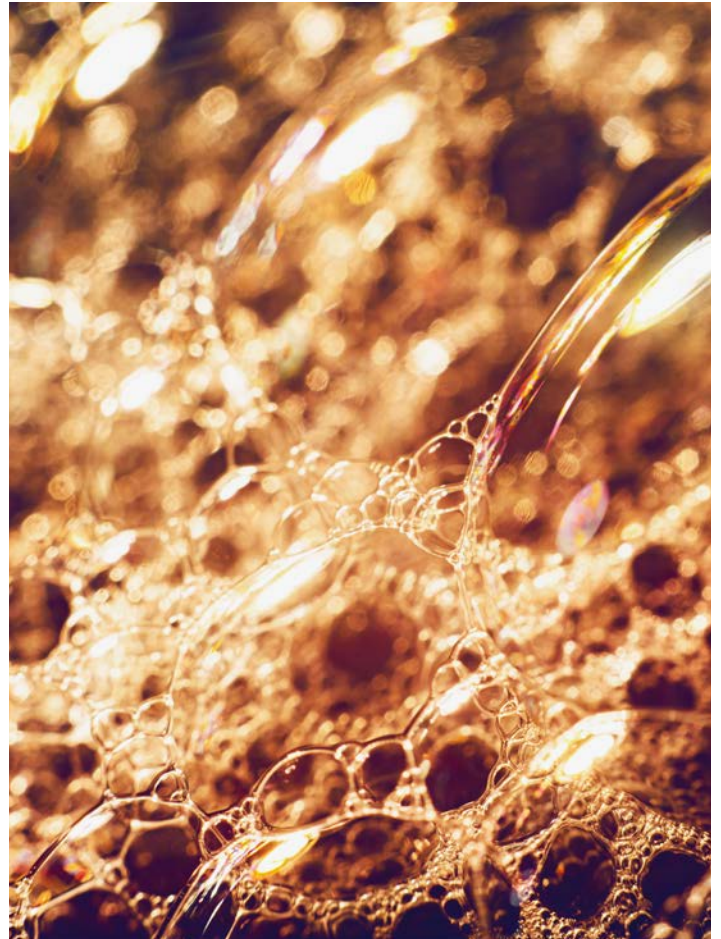
One way to improve the efficiency of brown stock washing is to control foaming, which can negatively impact product quality, production rates, and equipment efficiency. Almost every pulp mill uses a defoamer to maximize washing performance. In most cases, operators control the defoamer dosage with little or no assistance from automation technologies. Using advanced analytics to control defoamer dosing is a better option and can be achieved with a minimum amount of mill data and a modest investment in new equipment.

Smart Defoaming

Solenis has been developing digital technologies for many years, and the company has been able to bring several unique solutions to the market. For example, Solenis' SmartWash technology is a powerful digital solution that helps customers gain both economic and sustainability benefits. SmartWash combines defoamer chemistry with the Solenis [OnGuard™ iController](#) to adjust dosing based on process needs. The OnGuard iController utilizes an effective auto-adaptive dosing algorithm but with a relatively small data set.

Mills that install the OnGuard iController benefit from a premier digital innovation, which, when combined with Solenis' [Advantage™ brown stock defoamers](#), optimizes the washing process, stabilizes process conditions, and reduces costs. SmartWash is part of Solenis' full suite of advanced digital solutions, which includes [OPTIX™ Applied Intelligence](#), a paper process AI application for chemistry performance optimization and daily operator insights.

Solenis recently had an opportunity to demonstrate the benefits of the SmartWash solution at a bleached kraft mill in Sweden.



Mill Background

Solenis introduced SmartWash technology to this Nordic kraft pulp customer at the beginning of 2022. The mill is a world-leading manufacturer of liquid packaging board for packaging of beverages and food products intended for users demanding high levels of stability and printability. These high-quality end products require top-class raw materials, and the pulps are produced in their integrated pulp mill. The fiberline where the SmartWash technology is being used produces both bleached softwood and hardwood pulps and has an annual capacity of >300,000 tons.

Customer reported challenges were that “Before implementing SmartWash, it was common for operators to increase defoamer dosage levels to accommodate process problems and then forget to reset the levels. This led to over-consumption of chemicals.”

Now, using just a few dozen data tags from the pulp mill’s distributed control system (DCS), the SmartWash dosing algorithm continuously calculates new set points for each individual defoamer pump. The OnGuard *i*Controller communicates directly with the DCS, using the predefined data tags for calculations, and then automatically sends new set points. Operators can monitor the performance of the brown stock washing and defoamer pumps on their DCS screens and can adjust dosages manually if needed. Solenis experts can also adjust and fine-tune the algorithm in just a few minutes, giving excellent flexibility to the service.

After successful implementation of SmartWash technology in May 2022, the mill has seen significant benefits. “We have seen an increase in both pulp washing stability and efficiency,” notes the pulp mill production engineer. “We normally change between hardwood and softwood on a regular basis, and SmartWash helps us find the optimum dosage quickly, making it possible to manage defoaming control with minimal requirements from the operators.”

Ultimately, the mill was able to limit total organic carbon (TOC) carryover to the bleaching plant, resulting in reduced

usage of bleaching chemicals and providing both economic and sustainability benefits. According to the customer, this is just the beginning. “We are now working on increasing operator awareness so that they recognize when the system requires a parameter change to help lower the chemical consumption even further.”

Integrated Digital Solutions

The successful implementation of Solenis’ SmartWash technology at this Nordic kraft pulp mill is a testament to the company’s commitment to innovation and sustainability, and it provides a promising example for the industry as a whole. As the demand for high-quality pulp continues to rise, the adoption of innovative and predictive technologies will be crucial for maintaining the competitiveness of the pulp and paper industry in the future.

Given the range of digital solutions available, it helps to consult with an external provider that can recommend a system or combination of systems based on a mill’s unique needs. While AI and machine learning can give operations a powerful boost in efficiency, it is not always the one and only answer. In many cases, Solenis engineers can create an effective digital solution that can integrate earlier-generation technologies, such as the OnGuard *i*Controller, with more advanced technologies, like OPTIX. The result is a leap forward in a mill’s ability to monitor and control its key operations.

More Information

For more information about Solenis products and services, please contact your local Solenis field representative or visit [solenis.com](https://www.solenis.com).

