

PROCESSMINER™ |  Solenis™

EGUIDE

Maximize Efficiency in Pulp and Paper With AI-Powered Chemistry Control



SECTION ONE

Enable Pulp and Paper Mills With Advanced AI Solutions To Achieve Optimal Chemistry Application

In the pulp and paper industry, staying competitive requires continuously improving product quality while minimizing costs. Integrating AI into manufacturing processes offers a significant competitive advantage by enabling precise control over raw materials and chemical usage. This advantage is especially crucial given the dynamic nature of pulp and paper production, where traditional manual optimization often leads to inefficiencies and material overuse due to delayed reel-to-reel measurements.

By incorporating AI and predictive analytics into existing control systems, mills can shift from reactive adjustments to proactive optimization, ensuring they stay ahead in a competitive market. This shift allows operators to focus on overseeing production while AI autonomously fine-tunes process parameters in real time, resulting in consistently high-quality output, reduced material waste, and improved operational efficiency — helping mills meet and exceed their production targets.



SECTION TWO

Ensure Consistent Quality and Efficiency With AI-Driven Optimization

Maintaining product quality while optimizing raw material use is a constant challenge in the fast-paced world of pulp and paper manufacturing. The complexity of real-time process adjustments, especially for parameters like wet tensile and dry strength that are difficult to measure on the fly, often leaves operators relying on estimates and reactive decisions.

To address these challenges, a tailored, AI-driven control solution can make all the difference. An AI platform with robust machine learning capabilities can be configured to enhance your mill's operational efficiency and product quality. The platform can be customized for the specific needs of your machines, using up to 200 process tags to ensure precise control.

By generating real-time virtual measurements of critical quality parameters and seamlessly integrating them into an AI-driven control loop, you can achieve precise, autonomous adjustments to chemical programs. This ensures your operations stay on target, even as machine conditions change.

With a rapid implementation process, mills can realize these benefits in just a few weeks. The embedded machine learning continuously adapts to your unique process conditions, enabling accurate, real-time control that keeps your production running smoothly and efficiently.



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SECTION THREE

Gain a Competitive Edge With Precise Chemistry Control



In the pulp and paper industry, maintaining consistent quality while managing chemical costs is critical to staying ahead of the competition. The challenge lies in delivering the right amount of chemicals at the right time, especially during process fluctuations.

Traditional methods often leave operators making reactive adjustments based on delayed quality test results, leading to inefficiencies and overuse of chemicals.

With AI and predictive analytics, you can achieve optimal chemical dosage in real time, ensuring that your production process remains efficient and cost-effective. For instance, in one application, mills using an autonomous AI solution saw a significant 25% reduction in wet strength chemical usage, leading to substantial cost savings while maintaining high product quality. Another example showed an 18% average reduction in wet strength chemical usage across heavyweight grades.

This level of precision frees operators from constant manual adjustments and gives management confidence that the correct amount of chemicals is being applied at all times. AI-driven process control ensures that chemical dosage is consistently optimized, reducing waste and improving overall efficiency, which helps mills meet their production and quality targets without compromise.

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SECTION FOUR

Achieve Complete Autonomous Control of Chemistry Dosage

For pulp and paper mills, ensuring the precise application of functional chemistries is essential to maintaining product quality and reducing costs. However, manual control of these processes often leads to inconsistencies and inefficiencies. By leveraging AI-driven autonomous control, mills can optimize chemistry dosage in real time across all product grades, ensuring consistent quality with minimal waste.

Operators have quickly embraced AI-driven control as a valuable tool in managing wet strength chemistries. The relief from constant manual adjustments has empowered them to focus on expanding AI control to other areas of the manufacturing process, such as optimizing fiber utilization, enhancing sustainability efforts, and improving overall production efficiency.

This transition from basic chemistry control to more advanced, value-added applications demonstrates the versatility of AI in driving continuous improvement across the mill. As operators and management grow more confident in the capabilities of AI, the scope of its application continues to expand, opening up new opportunities for efficiency gains and cost savings throughout the production process.



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SECTION FIVE

Enhance Operator Performance With AI-Driven Support

In the pulp and paper industry, even the most experienced operators can struggle with the variability introduced by manual adjustments and periodic lab measurements. These traditional methods often lead to inconsistencies in the production process, as lab tests provide delayed feedback and are susceptible to human error. This variability can result in suboptimal quality and inefficiencies, making it difficult to maintain consistent production standards.

AI-driven solutions address this challenge by automating critical process inputs and providing real-time adjustments that eliminate the lag and variability associated with periodic lab measurements. By continuously monitoring and adjusting process parameters in real time, AI platforms ensure that quality targets are consistently met without the need for reactive manual interventions.

This allows operators to focus on the mill's core quality and production objectives, knowing that the AI system maintains precise control over the process. The result is a more stable production environment with reduced variability, leading to higher consistency in product quality and greater overall efficiency. The reduction in variability provides operators with a sense of security and confidence in the process.

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SECTION SIX

Prioritize Consistent Quality Outcomes



Consistent quality is a top priority in pulp and paper production, and variability in chemistry dosage can lead to costly off-quality output. Traditional manual adjustments often fail to maintain the necessary precision, resulting in fluctuations that can negatively impact product consistency.

By leveraging AI-driven autonomous control, mills can adjust chemistry levels in real time to meet quality targets without increasing reject rates. In one notable example, the implementation of AI led to a significant 23% reduction in variation of wet strength chemistry and a 63% improvement in target adherence. This precise control optimized wet tensile quality and eliminated off-quality production, providing operators with reassurance and confidence in the system.

These metrics demonstrate the powerful impact of AI-driven solutions in stabilizing production processes and maintaining strict adherence to quality targets, giving both operators and management confidence that their production lines are running at optimal efficiency.

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SECTION SEVEN

AI-Enabled Strategies for Sustainability

Meeting sustainability goals in the pulp and paper industry requires innovative solutions that balance environmental responsibility with production efficiency. AI plays a crucial role in optimizing fiber utilization, a key component of sustainable manufacturing practices. By leveraging AI, mills can ensure that the right amount of fiber is used in each production cycle, reducing waste and promoting sustainable resource management.

Through AI-driven control systems, the platform can autonomously manage the furnish mix to create the most economical and sustainable fiber blend. This includes incorporating recycled or off-quality paper into the production process without compromising the quality of the final product.

By making real-time adjustments based on the availability and characteristics of different fiber sources, AI ensures that mills can maximize the use of recycled materials, thereby reducing reliance on virgin fibers and minimizing the overall environmental impact.

Moreover, AI's ability to optimize fiber blends contributes to the efficient use of resources, reducing waste and energy consumption. This not only supports mills in achieving their sustainability targets but also enhances their competitiveness by lowering raw material costs and improving the environmental profile of their products.



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CONCLUSION

Now Is the Time for Advanced Solutions

In today's competitive papermaking industry, integrating predictive analytics and machine learning into production processes is no longer optional — it's essential for continuous improvement. AI delivers the precise control over functional chemistry dosage that mills need to maintain and enhance product quality and operational efficiency. By reducing variability, optimizing resource use, and incorporating sustainable practices, AI empowers mills to consistently meet and exceed their production goals.

The benefits of AI go beyond immediate efficiency gains. They align with the long-term continuous improvement strategies critical for staying ahead in the market. As mills strive to refine their processes, reduce waste, and enhance product consistency, AI provides the support necessary to drive these initiatives forward. For mills committed to ongoing improvement and excellence, AI is a proven solution that fosters sustained success in a rapidly evolving industry.



ProcessMiner, in exclusive partnership with Solenis through the OPTIX™ Applied Intelligence platform, is at the forefront of modernizing the pulp and paper industry. By integrating advanced AI, machine learning, real-time and predictive analytics, the platform delivers actionable insights. This enables mill operators to optimize production processes, reduce waste, and achieve consistent product quality.

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