

RAISING THE QUALITY STANDARD IN THE PULP AND PAPER INDUSTRY



Maintaining a pulp or paper mill has always required careful balance. Fiber, water, energy, and chemicals all flow via interconnected systems where even a minor disruption in one area can have an impact on the entire operation. If papermaking is a high-wire act, then optimization and automation are the safety net that keeps mills afloat when conditions change beneath them.

Today, these technologies are no longer nice-to-have tools for incremental efficiency. They are the backbone of quality improvement across an industry under pressure. Mills are realizing that conventional methods of quality management are insufficient due to a variety of factors, including aging infrastructure and workforce turnover to increasing operational complexity and customer demand for tighter tolerances. Sharper visibility, quicker feedback loops, and better real-time decision-making are all necessary for their success.

Converting noise into understanding

For decades, many mills relied on manual testing and operator intuition to keep production on spec. But judging quality by a handful of lab samples is like trying to understand a novel by reading only a few pages. Critical variations across the sheet or shifts in process conditions were easily missed, leading to costly rework or scrap.

Automation changes that equation. By embedding advanced sensors, data models, and closed-loop controls directly into the process, mills can monitor quality at a scale and frequency that human testing simply cannot match. Variations that once took hours or days to uncover now trigger near-instant alerts and corrective actions. The result is less waste, more consistent output, and a foundation for continuous improvement.

Of course, data alone doesn't solve the problem. In a modern pulp mill, streams of information pour in from every unit of operation. Without the right tools, it can feel less like clarity and more like standing in a hurricane of numbers. What sets today's optimization systems apart is their ability to filter, interpret, and transform raw data into actionable insight.

Advanced process control, for example, can stabilize notoriously complex operations such as lime kilns or recovery boilers. These are environments where sensors often struggle, and variables interact in non-linear ways. By applying predictive models and optimization algorithms, mills can reduce chemical use, improve product uniformity, and extend equipment life, all while keeping safety risks in check.

In paper production, automated quality testing has had a similar effect. By capturing ten times more data points per reel than manual methods, automated systems can paint a detailed picture of strength, basis weight, and fiber orientation across the sheet. This "full-canvas view" empowers operators to make on-the-fly adjustments that prevent off-spec rolls, while also uncovering opportunities to reduce basis weight or additive use without sacrificing performance.

Moving from silos to systems

But the real frontier for quality improvement lies in breaking down the walls between individual processes. Mills have historically managed operations in silos with a digester here, bleaching there and machines downstream. Each department optimized within its own boundaries, often at the expense of the mill as a whole.

That's why the launch of new mill-wide optimization software, such as ABB Ability™ Plant Optimizer for Pulp Mills, marks such an important shift. By linking production planning with real-time operations, these systems turn a patchwork of local decisions into a coordinated strategy. They track material flows and quality-critical variables across every unit, making it possible to trace a deviation back to its root cause instead of just treating the symptoms downstream.

It's less like patching leaks in a pipeline one at a time and more like controlling the entire flow from the source. When every stage of production is connected and coordinated, mills can manage quality as a continuous process rather than a series of isolated fixes.





Flexibility in a time of uncertainty

Quality today is about maintaining high-specification standards as conditions shift. Mills face volatile fiber supply, rising energy costs, unexpected equipment upsets, and fluctuating customer demand. In this environment, static planning falls short.

Dynamic optimization tools are helping mills move beyond reactive firefighting toward proactive, scenario-based decision-making. By modeling alternative production plans, simulating shutdown and startup strategies, or identifying bottlenecks before they bite, mills can adapt without compromising quality. The ability to calculate optimal setpoints and production rates on demand, or even continuously, helps balance throughput, cost, and resource use within the existing asset base.

This agility is not just about efficiency. It builds resilience at a time when many mills are grappling with retiring expertise and fewer experienced operators on the floor. Optimization software acts as a digital mentor, embedding best practices and providing decision support that keeps newer teams working with greater confidence and consistency.

Using quality as a competitive advantage

Despite the pulp and paper industry being centuries old, real-time data and automated control will shape its future. The mills that view quality as a thread woven throughout the entire manufacturing process rather than a checkpoint at the end of the line will prevail.

Optimization and automation are bringing that vision to life. They enable mills to use raw materials more efficiently, cut waste and prolong equipment life. More importantly, they provide manufacturers with the assurance to satisfy increased customer expectations without increasing expenses.

Consistent quality is essential for building confidence and long-term growth in a market where packaging strength, tissue softness, or pulp purity can make or break customer relationships. Mills that invest in more intelligent processes now will be better equipped to produce the quality their markets demand later.