

Automated paper testing enables data-driven innovation for quality management at Wisconsin's newest mill



Wisconsin's first new, state-of-the-art facility in over 35 years came online in March 2021. A replacement of its 73-year-old machine, Green Bay Packaging's new recycled paper mill was built with modernization at its heart and required best-in-class paper testing to ensure repeatability. The mill chose ABB's L&W Autoline, moving from manual to automated testing at its new operation.

New facility brings modernization opportunities

Green Bay Packaging (GBP) is a family-owned, vertically integrated manufacturing company headquartered in Green Bay, Wisconsin, USA. Dedicated to the innovative development of its products and forestry resources, GBP has a focus on continuous improvement at all 36 manufacturing facilities across 14 states.

Most recently, GBP decided to replace the Green Bay site's recycled paper machine (PM3) – originally constructed in 1948 – with a brand new testliner machine (PM4) in a move that both preserved its 1500 Wisconsin jobs and added more. The new mill brought opportunity for other improvements, such as automated paper testing.

Moving from manual to automating paper testing

As a long-time user of L&W benchtop equipment for PM3, GBP was impressed with the quality of the instruments and saw that same superior reliability and performance in ABB's automated testing system. This made L&W Autoline the first choice for PM4 at the new facility.

"We wanted to bring modernization and automation to the new mill," added Bob Mihalski, Director of Continuous Improvement for GBP. "A couple things really stood out about the Autoline L, such as the speed and volume of the test and the ability to take out testing variation between operators."

"Having an Autoline, we are able to run hundreds and thousands of data points at the same time," Blake Schweiner, Quality Manager for GBP, added. "Benchtops couldn't do that. And we get more detailed profiles of the sheet for the whole width of the paper."

Digitalized quality management

Testing has never been easier and for GBP, that starts as soon as the reel turnup. While the traditional way to start testing a sample in the Autoline is as simple as scanning a barcode, GBP has connected their QCS and data historian so that the record for the sample is automatically populated in Autoline based on turnup tags – no scanning required.

But perhaps the biggest tool for the mill is the ability to visualize quality parameters in graphs by reel and/or grade within the user interface.

“Anytime we run a sample, 10 to 15 people can see what the profile looked like from starting conditions and how it affected the final sheet. We can visualize that all in one space,” said Schweiner.

“And that’s not only from reel to reel, but the CD profiles across the web too. We get an instantaneous graphical visualization to create metrics and adjust targets,” added Mihalski. “Plus, it’s quicker than benchtops. We are using the graphics in the system and sending it back to the historian, and it gets to multiple people in and outside the lab.”

Faster single point testing

Occasionally mills need the ability to retest stored samples. With L&W Autoline, operator safety is designed into the system, and different testing options allow users to test a single point of the retained paper sample.

“We can test a sample in a very similar way we could do with the benchtop, but with this, it takes five seconds,” said Schweiner. “And a lot of our interns and co-ops use it to solve problems. They can quickly test 15 samples – and bam, there’s the answer. The system is always calibrated, so it makes it easy.”

Repeatability opens novel testing opportunities

L&W Autoline provides a complete profile report in under ten minutes, including 100 quality parameters by CD position. This availability of data makes special projects more of a reality. “If we are relying on manual testing, we would only get an average of a CD strip,” said Mihalski. “Now we can find new areas for optimization with the complete CD profile information.”

GBP has even taken these special projects one step further. “We run studies we wouldn’t be able to run because of the repeatability of the system,” said Schweiner.

“For example, instead of a CD strip, we unwound a reel to cut and place an approximately 125 foot sample through the Autoline to get an MD profile. This allowed us to take CD process variation out of the picture. What we are working on is just a theory at this point, but we have the data for analysis.”

“If we tried to do this manually, it would tie up the operators and take way too long, and we couldn’t necessarily trust the tests without the repeatability Autoline offers,” Schweiner added. “We can run a few thousand tests automatically, which is a big help (for our special projects).”

High availability with simple maintenance

A standout feature for the mill is the Autoline’s high availability and simple maintenance procedures that allow the operators to work through any issues themselves. The user interface has pop-up windows for common system problems that identifies what and where an issue is.

“There are typically five actions that solve 99% of the common issues, making it easy to find the problem and fix the problem” said Schweiner. “The modules are easy to get to, but we haven’t had the need for much maintenance, which is really nice.”

A modern upgrade for any mill

Some mill personnel had experience with the L&W Autoline 400, and marveled at the many advancements in the latest generation.

“The L outperforms the Autoline 400,” said Mihalski. “It’s more user friendly. More reliable. Even the look of it, it’s just an overall better experience.”

Benefits in moving to automated testing

- Better consistency of tests
- Increased number of tests and data points
- Novel testing for special projects and optimization opportunities
- Quicker feedback to production with built-in, intuitive graphics and complete CD profile information
- Saves time by being able to run many more tests more efficiently including single point testing
- High availability with minimal maintenance and calibration
- Identifies areas of quality improvements needed in CD profiles, therefore increasing overall strength averages