
CASE STUDY

ABB helps FPC Papeles Chile to break production records by stabilizing process and quality with L&W Freeness Online



Near Concepción on the heavily forested Pacific coast of Chile, FORESTAL Y PAPELERA CONCEPCIÓN S.A (FPC Papeles) transforms post-use Old Corrugated Cardboard (OCC) and Double Lined Kraft (DLK) into new test-liner and fluting papers for the Chilean packaging industry.

As an industry leader clearly committed to sustainability and recycling, FPC Papeles is dedicated to reusing raw materials. However, to ensure output of the highest quality, the company must face the challenge of working with a wide variation in the properties of incoming fibers, which they acquire from 27 cities and five customers.

“All papermakers know that variation in raw materials significantly affects process stability and product quality,” explained FPC’s Technical Director, Eduardo Izquierdo. “To overcome this, we sought a way of adapting our processes to the naturally variable incoming fibers to both stabilize quality and reduce costs.”

Ultimately, they looked to refine incoming fiber only as much as necessary to achieve consistency in a cost-effective way without compromising quality. This is sometimes referred to as fiber-to-fiber (F2FR) refining.

“Starting in 2017, we became laser focused on finding the perfect balance in refining,” said Izquierdo. “Thus began our quest to implement an F2FR strategy.”

Challenge: fiber variation

Originally, FPC’s mill operators had responded to variations in incoming fiber quality by manually modifying the refining load based on lab measurements of pre- and post-refiner freeness taken every two hours. Combining these results with final paper properties every 45 minutes usually led to increasing the refiners’ load. If that was not successful, other methods were tried, such as adding more chemicals, enriching the blend with more DLK or finally, downgrading the product resulting in an ineffective cost cycle.

Having previously upgraded their refiners to enable automatic modification of their disk gap based on fiber mass flow, FPC needed a way to determine when to open and close the gaps to provide the required refinement load, avoiding the delays between lab measurements of freeness.

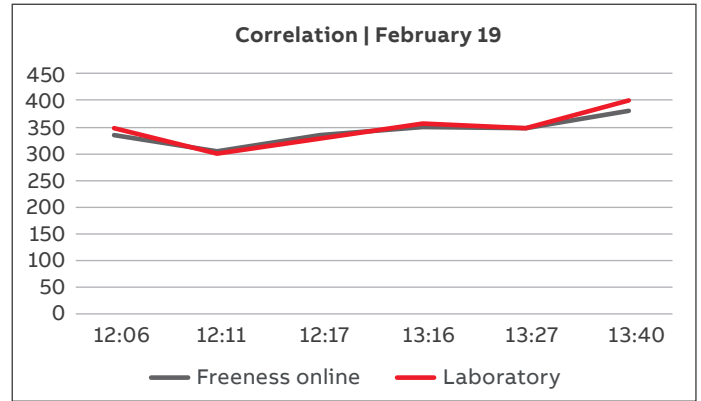
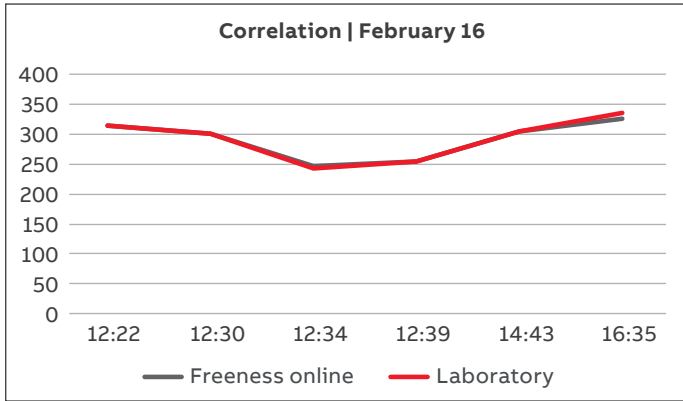
“It was rapidly becoming clear that the long delay between lab freeness measurements was masking fiber variations, making it impossible to implement our F2FR strategy. Our tests indicated that an on-line freeness measurement system was crucial to help expedite the time between measured process variation and process control actions,” explained Izquierdo.

Solution: Online measurement system for stabilization and consistency

To meet this requirement, in early 2018, FPC Papeles installed an ABB L&W Freeness Online system equipped with two samplers. This enabled operators to measure freeness efficiently at the output of the mill’s two refining circuits and more closely modify the refining process based on the properties of the incoming fibers.

“Following a two-month validation period, during which L&W Freeness Online and lab readings were regularly compared and correlated, operators placed their full trust in the new system and began to manually adjust the refiners’ load based on the L&W Freeness Online readings,” said Izquierdo. “This enabled us to adapt our refining process to changes in the incoming fibers, helping to stabilize the overall process.”





L&W Freeness Online results were regularly compared against laboratory results to ensure accuracy. This example shows the comparison over a two hour period, on two separate days, with nearly identical results.

Not only did this help confirm measurement reliability and stabilize operations, it also builds confidence in future improvements. A natural next step would be to close the control loop to automatically run refiners from online freeness measurement with Advanced Process Controls (APC). For example, Refiner Control, an APC solution based on Freeness, could save 10-15% on energy and make the process even more stable than it is today.

Towards Fiber-to-Fiber-Refining (F2FR): using on-line freeness measurements

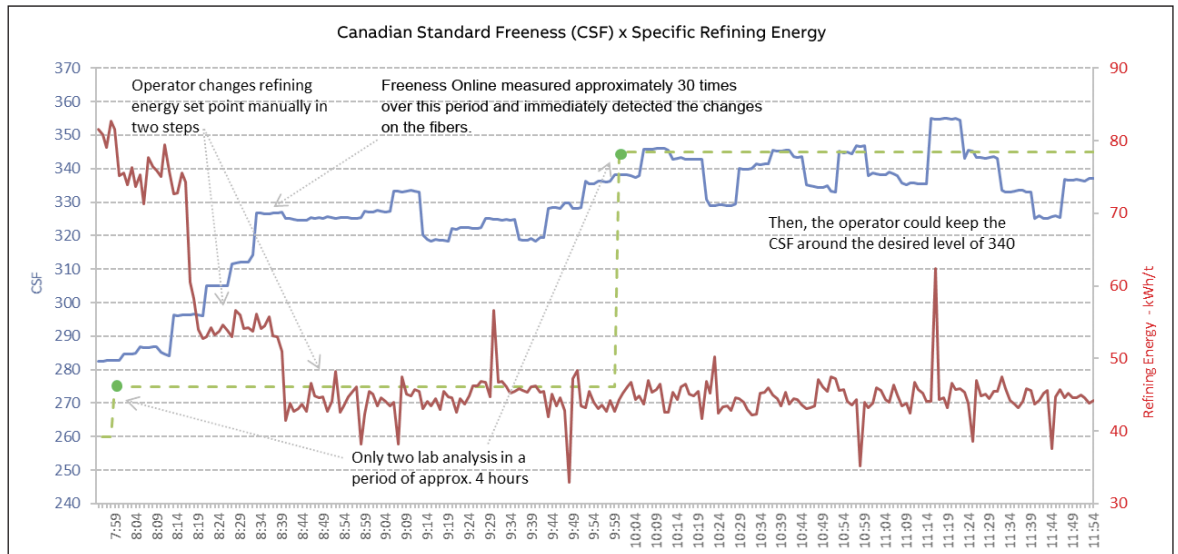
For FPC Papeles, L&W Freeness Online has provided a fast, reliable and cost-effective online system for measuring, monitoring and controlling key quality variables of incoming fiber. Moreover, it's helped FPC attain a new level of process stability, reducing production costs through lower energy consumption by eliminating over refining. It has also contributed to creating the best possible continuous and uniform pulp furnish.

Following installation, and with other improvements at the mill, FPC twice exceeded its monthly production record during 2018. This in turn contributed to an annual output of more than 100,000 tons for the first time in the mill's history.

“Before L&W Freeness Online was installed, it would take the mill six-to-eight hours to achieve a pulp consistency for uniform paper production to meet the required specs. Now it takes less than an hour.”

The system's combination of simple and sturdy design with almost no moving parts and outstanding after sales support from ABB and FCP instrumentation staff, is a further advantage and the company reports that their machine still looked like new over a year after start-up.

L&W Freeness Online was able to measure every 6-7 minutes – significantly less than the two-hour intervals of the manual test – helping to quickly detect the fiber changes. Without online measurement, the operator could not safely manipulate refining energy and maintain the freeness at target level.





Benefits

- Increased production
- Improved process optimization
- Reduced grade change time
- Lower energy consumption
- Improved and uniform pulp production
- Faster and accurate measurement

L&W Freeness Online

L&W Freeness Online is a reliable, repeatable and cost-effective online system for measuring, monitoring and controlling key quality variables - Canadian Standard Freeness (CSF) and Schopper-Riegler (SR) - in paper stock preparation. The greatest impact for papermakers is how quickly operators can make changes to the process. This is due to the automatic and complete measurement cycle that expedites results and improves accuracy. The system also allows for multiple low-cost sampling points with a single instrument, reducing initial investment cost and ongoing maintenance costs.

“We are delighted with the L&W Freeness Online solution and the support we have received from ABB and MX-Chile, an ABB distributor who helped with installation and support, during this project. We look forward to continue working with them in the future to achieve higher levels of process stability, savings and final product quality. Following these record-breaking successes, our next step is the move to fully automated refining load adjustment using the Freeness Online system’s readings.”

Eduardo Izquierdo, FPC's technical Director

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