

PULP AND PAPER

ABB Drive System enhances energy efficiency at UPM's Changshu Paper Mill



UPM Changshu mill

Since its installation in 1997, the ACV700 drive system for PM2 WN2 (Rewinder II) at UPM's Changshu mill in China has been a model for reliable rewinder operation, thanks to its enduring reliability and diligent maintenance by the mill.

However, due to increasing market competition and the need for new paper types, coupled with the challenge of sourcing aging spare parts, UPM and ABB partnered in March 2023 to upgrade the rewinder drive system to the latest ACS880 model.

Revamping projects are often challenging due to tight schedules and heavy workloads, and this one was no exception. To align with UPM's production schedule, ABB's Pulp and Paper team in China conducted a site audit in September 2023 and swiftly determined the optimal system configuration. Throughout the project, engineers from both UPM and ABB collaborated closely, overcoming obstacles such as high temperatures, noise, and a complex working environment. Their efforts paid off when WN2 successfully started up on January 18, 2024, as planned.

Following the startup, UPM faced new challenges related to the stable operation of the rewinder due to significant changes in paper types, including variations in grammage, tensile strength, and elasticity. To address these issues, ABB and UPM teams worked together to continuously adjust control parameters and optimize the drive system, utilizing the advanced Direct Torque Control (DTC) technology of the ACS880. As a result, the rewinder has now achieved the high-speed production standards required for all paper types produced on the paper machine.

"We chose ABB because of our trust in the quality of their products, their excellent system control accuracy, the professional commissioning capabilities of their engineers and their valuable support for UPM projects. As a global technology leader in the field of electrical automation, ABB is committed to empowering a sustainable and resource efficient future, which fully demonstrates its role as a model multinational company with rich management capabilities and advanced technological reserves",

shared Mr. Wu Jianjun, Senior Maintenance Manager of Fine Paper, UPM Changshu mill.

Three months after the deployment of the new drive system in March 2024, data analysis revealed a 5% monthly reduction in power consumption for Rewinder II compared to the pre-upgrade period, leading to an expected annual cost saving of 450,000 yuan. The ACS880 system offers several advantages over the older ACV700, including:



Rewinder II, UPM
Changshu paper mill.



Enhanced energy efficiency:

ACV700, launched in the 1990s, used GTO power electronics, which had higher dynamic and static losses due to the semiconductor technology of that time. ACS880, with its advanced semiconductor technology, optimized control algorithms, and efficient inverter air-cooling system, reduces energy loss and lowers operating costs. This multi-drive system enables more efficient energy use, energy feedback, and sharing while reducing harmonic content, thereby improving overall efficiency and cost-effectiveness.

The upgrade of UPM's PM2 WN2 drives system has not only boosted production efficiency and enabled the mill to achieve substantial energy savings, and together UPM and ABB will continue to collaborate on more efficient and sustainable solutions.

This project exemplifies ABB's commitment to helping its customers optimize operations and drive high-quality development for China's pulp and paper mills. By providing energy-efficient automation solutions, ABB is not only enhancing competitiveness but also setting a new standard for energy conservation and emission reduction in the papermaking industry. ABB looks forward to expanding its partnership with UPM and partners to promote sustainable industry development and contribute to global green initiatives.



Advanced motor control technology:

ACS880's DTC offers superior motor modeling, magnetic flux control, and efficiency compared to traditional vector control, particularly for rewinders that require frequent acceleration and deceleration. This results in higher control accuracy with lower energy loss.

ABB's drive system



Optimized drive control:

ACS880 provides better adaptability during acceleration and deceleration phases when producing different paper types. Combined with precise motor control, this leads to a 6% improvement in operating efficiency. Enhanced control accuracy also significantly reduces paper core tube wear and lowers consumable costs.

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