

Automation Case Study Super Calender Machine for the Paper Industry

Customer Profile

A leading paper machinery OEM in North India specializes in the design and manufacture of paper finishing and converting equipment for paper mills across the country. For its newly developed Super Calender Machine, the customer was looking for a high-performance automation solution capable of maintaining precise web tension and delivering consistent paper smoothness, gloss, and thickness uniformity. After evaluating conventional automation options, the OEM selected Inovance as a reliable and cost-effective partner for this application. This project marked the customer's first implementation of Inovance automation products in a paper processing machine.

Application Overview

A Super Calender Machine is used in paper manufacturing to improve surface smoothness, gloss, and thickness uniformity by passing paper through a series of heated and pressure-controlled rollers.

Key Functions

- Enhances paper smoothness by 30-40%
- Improves printability and coating uniformity
- Maintains controlled paper thickness reduction
- Ensures consistent surface finish at high speeds

This process demands highly accurate tension control to prevent wrinkles, breaks, and quality variations throughout the calendering operation.

Customer Challenges

Customer faced several critical requirements:

- Maintaining constant web tension across the entire process
- Detecting paper breakage and stopping the machine instantly
- Preventing tension fluctuations during acceleration and deceleration
- Achieving stable winding and unwinding performance
- Replacing higher-cost competitor systems

These requirements were essential to ensure consistent product quality and machine reliability.



Super Calender Machine

Inovance Solution

Customer faced several critical requirements:

- MD520 AC Drive with dedicated tension control firmware for winding/unwinding
- MD520 AC Drive for the unwinder section
- H1U PLC and IT7000 HMI for machine control and process logic

Advanced motion algorithms ensure precise coordination between all axes, replacing traditional mechanical linkages.

Advanced Tension Control Features

- Open-loop tension control
- Automatic roll diameter calculation
- Friction force compensation
- Dynamic correction coefficients
- Constant linear speed control

These built-in functions enabled precise and stable web handling throughout the calendering process.

Results Achieved

After successful commissioning, the customer achieved:

- Stable and consistent web tension across all operating speeds
- Immediate break detection and rapid machine response
- Improved paper finish quality and gloss uniformity
- Smooth winding and unwinding performance
- Reduced commissioning time
- Cost-effective alternative to other brands

The success of this project marked customer's first adoption of Inovance automation products and demonstrated strong performance in demanding paper industry applications.

Why Inovance?

Inovance's industry-specific drive features and application expertise provided a reliable, efficient, and economical automation solution for the Super Calender Machine.

Benefits Delivered:

- Dedicated winding and tension control firmware
- Fast and simple commissioning
- High process stability
- Improved product quality
- Competitive total cost of ownership



Inovance Solution



Working Principle