CASE STUDY

01-05

# Specialty Paper Manufacturer

## Leading global supplier of high-gloss paper and packaging

### The Problem

A North American paper manufacturer was experiencing challenges with their specialty paper process. Wet coating streaks were causing build-up on the roll covers, damaging the surface and costing the plant $1M USD annually per machine in unplanned downtime, maintenance, and lost production. Optical cameras weren't sensitive enough to detect the subtle changes in sheet characteristics and moisture content associated with streaks.

### Eigen's Intelligent Inspection Solution

- Set of FLIR thermal cameras installed prior to the calenders
- Eigen Smart Module connected to the machine to trigger an alarm and open calenders upon cold streak detection
- Timeline of 3 months to fully operationalize automated calender stack offloading

## THE RESULTS

### Damaged Calender Events - Total Across 3 Machines

30 EVENTS

Before Installation

0 EVENTS

After Installation

3 MONTH ROI

$1.2M TOTAL SAVINGS

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# Detecting Cold Streaks in Specialty High-Gloss Paper

A leading global supplier of printing, packaging, and specialty papers was experiencing challenges with coating streaks in their matte and high-gloss packaging and paper processes that resulted in build-up on calender rolls and significant damage to the system.

Calendering is an important part of the process where paper thickness and finishing is refined before rolls are cut and distributed. Excess moisture on the web can lead to build-up on the roll that cuts the thin rubber surface. Events occur within 7-10 seconds and cost up to $100,000 USD in damage and lost production per event.

The plant operates three paper machines (A, B, and C) with optical cameras installed on machine B to identify holes in the sheet. Optical cameras, however, aren't able to detect the subtle changes in temperature associated with coating streaks, leaving the system vulnerable to damage.

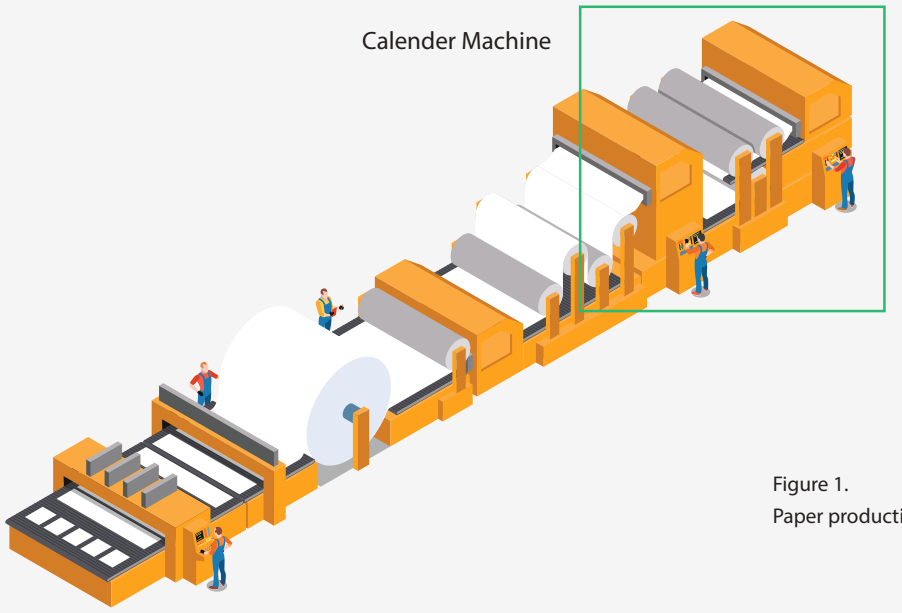


Figure 1.
Paper production process

## INSTALLATION

# Applying Thermal Inspection to Detect Coating Streaks and Notify Operators

A set of thermal cameras installed prior to the calendering section on all three paper machines continuously inspects the full width of the sheet. An Edge computing device installed on each machine efficiently processes real-time image and video data as well as all machine sensor data.

Immediately after installation, Eigen's solution begins capturing detailed temperature profiles of the web before it enters the calendering machine. Cold streaks indicate excess moisture so basic temperature limits are set to enable real-time alarms on the plant floor.

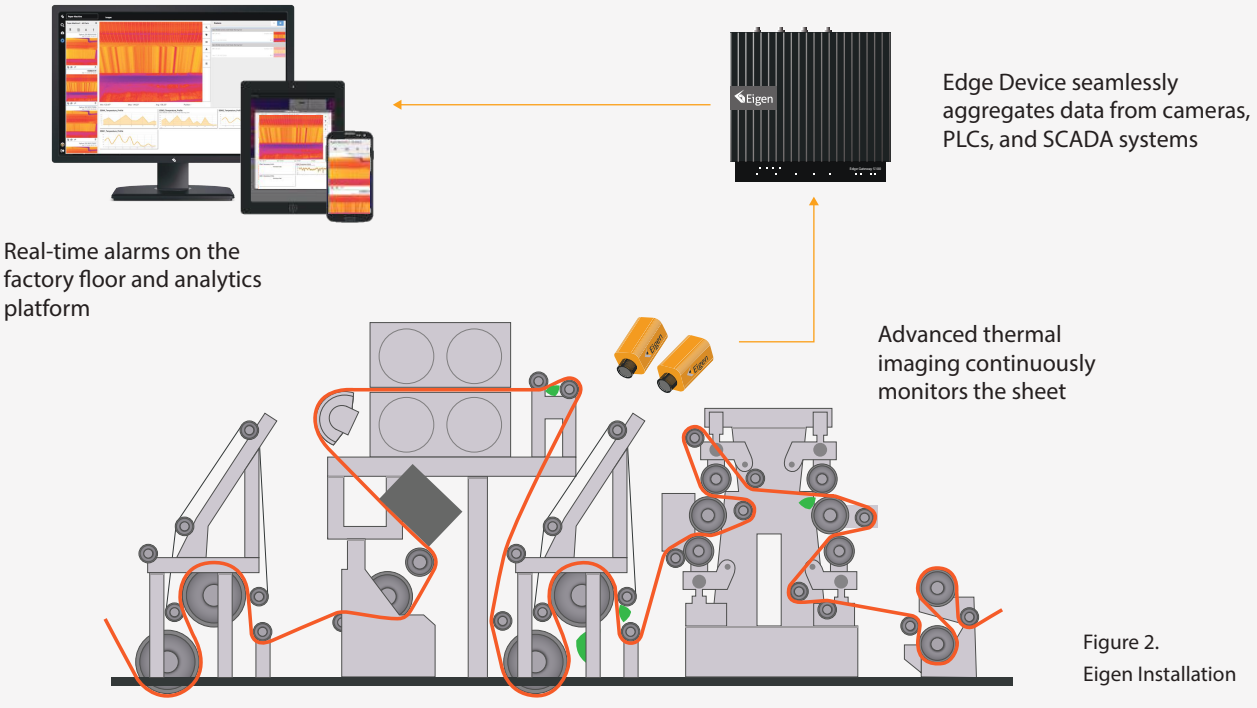


Figure 2.
Eigen Installation

AUTOMATION

# Enabling Automatic Pressure Reductions to Protect Calenders

Following a trial period to refine the algorithm and ensure accuracy, communication to the machines' respective PLCs is enabled. Calender stacks are automatically opened upon detection of cold streaks allowing operators to clean the roll covers and prevent surface damage.

The system also allows for more detailed analysis of temperature profiles, images, videos, and machine sensor data through the platform for troubleshooting and root cause investigations.


Figure 3.
Screenshot of real-time temperature profiles

## COST SAVINGS

# Estimated Annual Cost Savings

Cost savings are estimated based on the total costs associated with events (damaged calender rolls requiring replacement) including unplanned, downtime, repairs, maintenance, and lost production. Costs associated with unload alarms are calculated based on an average of 5-15 minutes of production of off-spec paper per unload due to roll cover cleaning by operations.

Before Installation (Annual Data)


After Installation (Annual Projection)