



OUR NAME IS INNOVATION

# A World of Expertise

## FPInnovations Recent Cases Studies



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“The RTF allowed simulating our customer’s problems: a severe bagginess issue. The technical team has a solid background, from which we truly benefited.”

***-Technical representative of a mill producing highly specialized papers***

“We have often leveraged the combination of analytical services and technical expertise at FPInnovations to address end-use performance issues and to help guide our development activities. Pulp and paper operations across the industry can be well served by embracing their unique skill set.”

***-Peter S. Ham, Technical Director, Temboard***

“FPInnovations’ expertise helped us demonstrate beyond the shadow of a doubt that our client’s wrinkling problem came from their printing press.”

***-René Cormier, Technical Director, WestRock***

“The mill now has the key information on the performance of its numerical grades and has since greatly improved standard operation practices.”

***-Larry Nadeau, Senior Process Specialist, Domtar***

# Baggy Edges and Bagginess Issues

## Confidential (Europe)

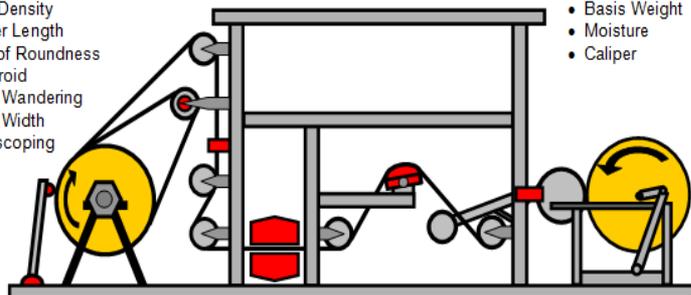
FPIInnovations was engaged to solve bagginess and wrinkles issues at the mill as numerous incidents resulted in important rejects and claims from major customers. The goal of this project was to identify the root causes of the problem to improve web performance .

### Approach

- Client's rolls were diagnosed with FPIInnovations unique Roll Testing Facility
- The RTF enabled the precise measurement of the CD tension profile across PM width.
- Investigation of the data provided by the RTF helped localize the problem

#### ROLL STRUCTURE DATA

- WIT-WOT Curve
- Roll Density
- Paper Length
- Out-of-Roundness
- Centroid
- Web Wandering
- Web Width
- Telescoping

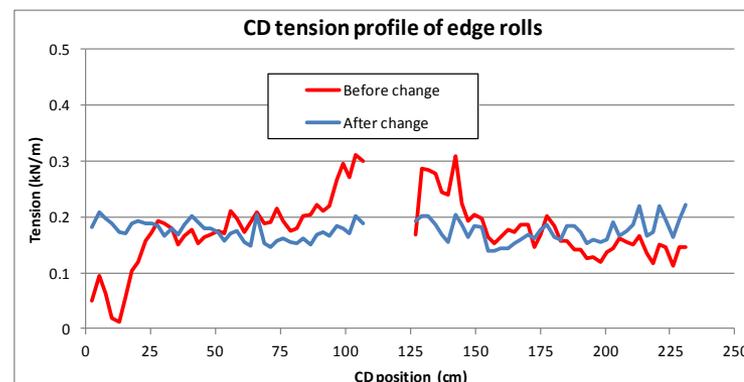


#### WEB UNIFORMITY DATA

- Bagginess Quantification
- Basis Weight
- Moisture
- Caliper

### Value Received

- FPIInnovations worked closely with the mill to implement new parameters of operation that solved the problem:
  - Improved moisture uniformity
  - Improved drying history on paper machine



# Winding Issues: Crepe Wrinkles & Bursts

## Confidential (North America)

A major LWC grade producer requested FPInnovations' help determining the cause of significant web breaks increase (from 8% to 32%) for paper rolls off the rewinder. Claims were so high that the rewinder had to be shut down (\$4M/year loss in operation cost).

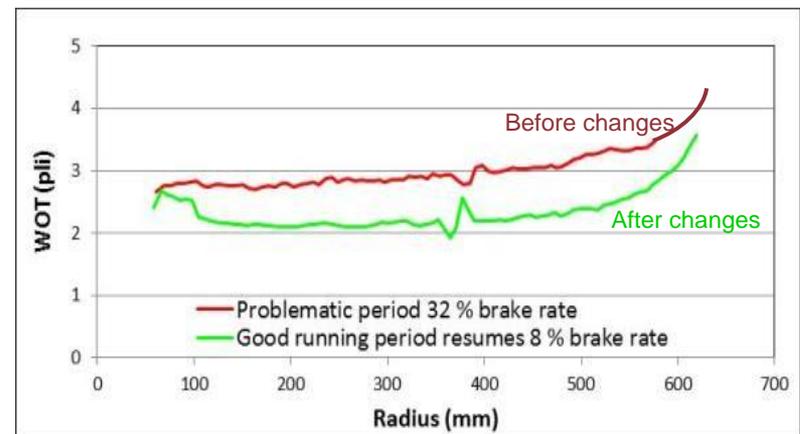
### Approach

- A visual inspection shows bursts at surface of rolls due to high wound-in-tension.
- Wound-Out-Tension (WOT) curves were obtained with FPInnovations' RTF to test changes on rewinder
- New operating parameters were defined:
  - Lower rider roll pressure, web tension and torque



### Value Received

- FPInnovations worked closely with the mill to implement new parameters of operation that solved the problem:
  - Less bursts and crepe wrinkles
  - 4 times less web breaks at customers



# Barring Issue

## Confidential (Canada)

The client requested that FPInnovations identify and solve a recurring barring issue on its paper machine. This issue was impacting the paper caliper and strength (web breaks) and its visual quality (gloss variations). The problem was impacting the client's sales.

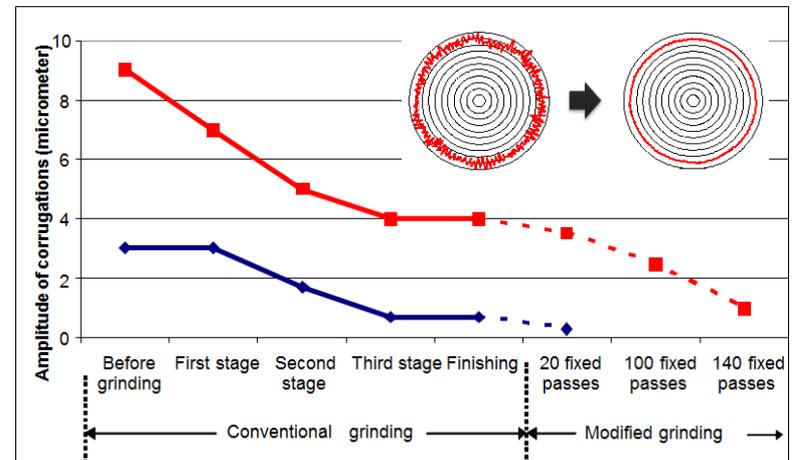
### Approach

- On-site measurement with calendar roll measurement tool developed by FPInnovations, showed that rolls' grinding was not done properly.



### Value Received

- FPInnovations has been able to implement new grinding techniques that ensure the delivery of calendar rolls with no residual barring.



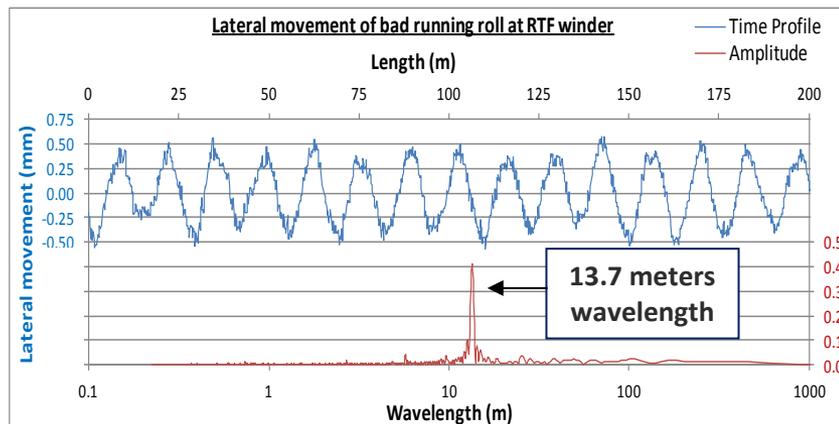
# Web Weaving Issues

## Confidential (North America)

FPInnovations was asked to solve a web weaving issue on press that led to misregistration and quality issues with the final printed product. For the mill, the amount of claims and paper rejects reached several \$100K/year.

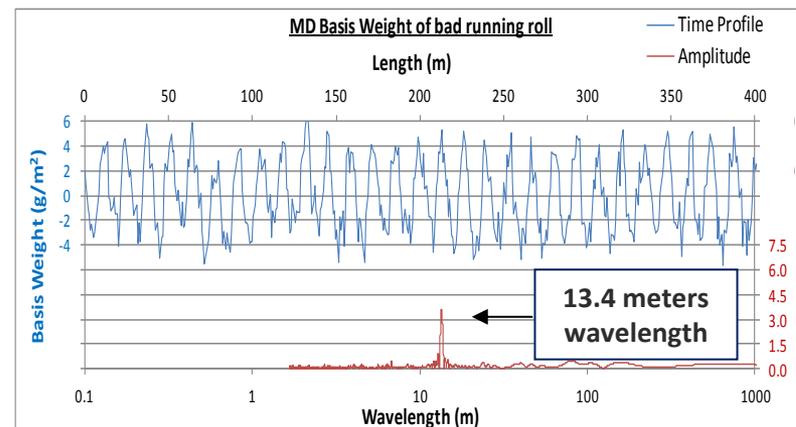
### Approach

- Laser beam sensors installed on the Roll Testing Facility (RTF) allowed for the quantification of web lateral movements.



### Value Received

- Tapio analysis allowed for the identification of similar wavelength in the basis weight and ash content.
- Problem was at the coated rod, and replacing it solved the issue.



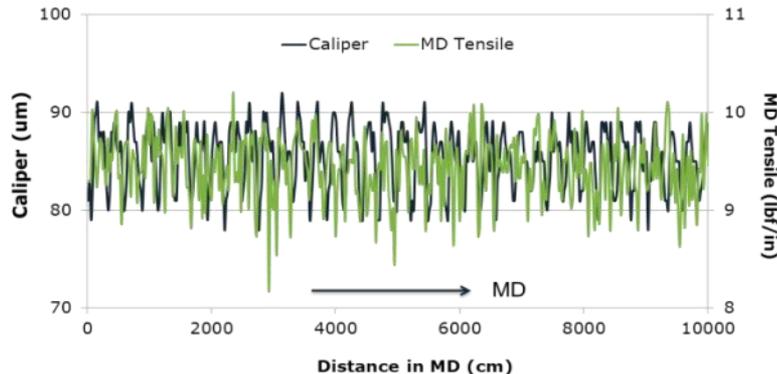
# Web Breaks Issues

## Confidential (Canada)

FPInnovations was asked to analyze a web breaks issue on press that led to rejects. The amount of claims and paper rejects reached \$0.5M/year for the mill.

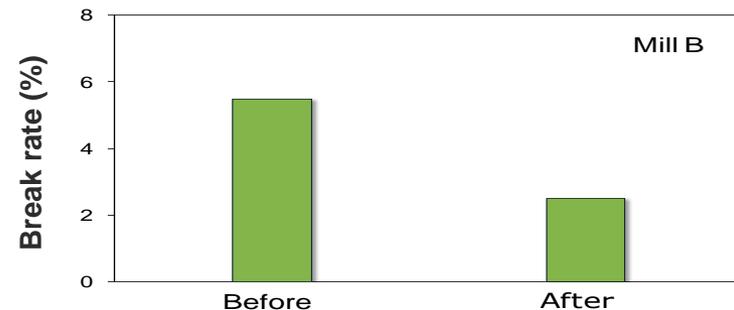
### Approach

- Analysis of the strength uniformity in machine direction (MD) helped to identify a cycle corresponding to King roll rotation.
- Caliper variations in MD explained the strength losses and subsequent web breaks.



### Value Received

- FPInnovations found that the King roll eccentricity (due to non-uniform shell thickness) explained the caliper and strength variations in MD.
- Corrections in the shell thickness helped reduce caliper and strength variations, and thereby reduced web breaks by half.



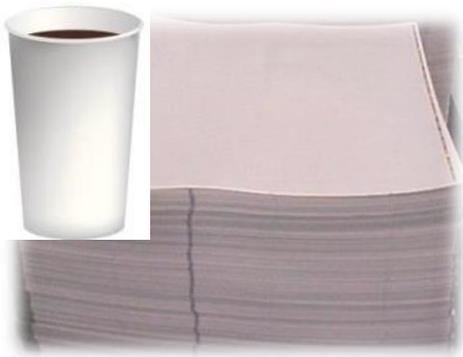
# Curl Issue

## Confidential

FPIinnovations was engaged to determine the root causes of a curl issue of the cup grade. The curl caused jam and frequent downtimes at a paper cup manufacturing facility who was a major supplier of a well known restaurant chain (thousand of tons/year).

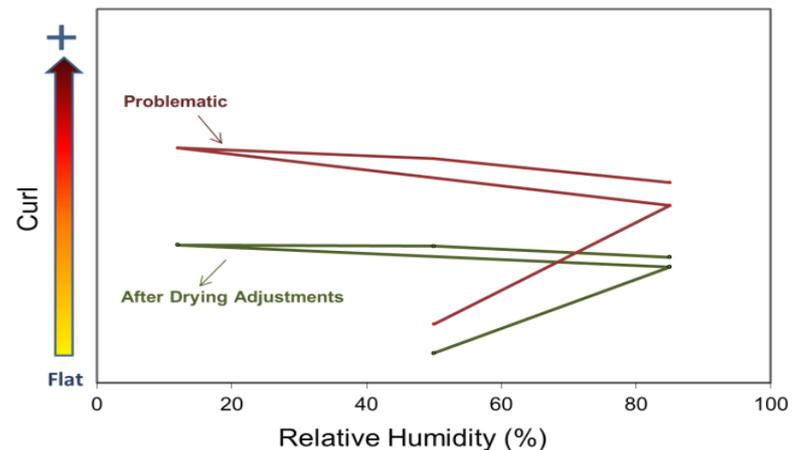
### Approach

- Used FPIinnovations curl evaluation method to identify the key contributing factors
- Supported the mill to establish the corrective action plan for reducing the curl



### Value Received

- Curl was no more an issue at the customer
- The mill gained a better understanding of the curl propensity of their grade and optimal machine operating condition to minimize it.



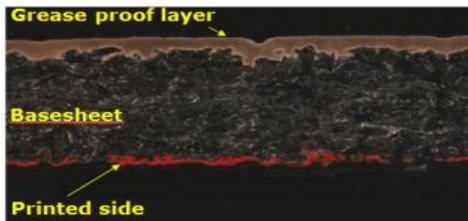
# Grease-proof board

## Confidential

A client who was producing grease-proof board for food packaging asked FPInnovations to address the edge wicking issue. The grease penetrated at the edges of the board and the windows where the product is demonstrated. The poor appearance of the package made it less attractive compared to competing products on the shelf.

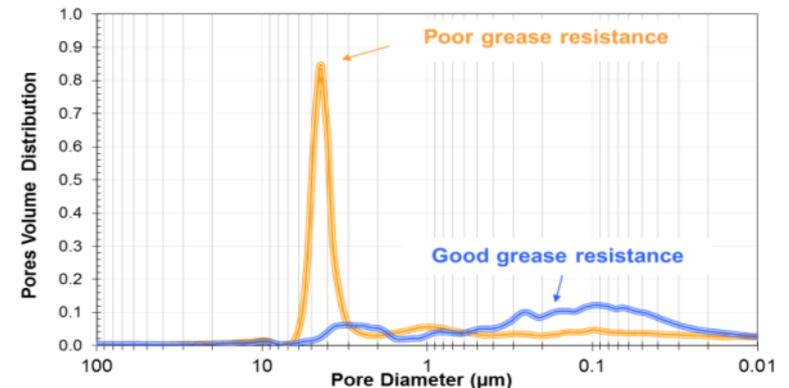
### Approach

- Combined advanced analysis tools to identify the key driving factors causing grease penetration:
  - SEM Microscopy
  - Mercury Intrusion
  - Contact Angle
- Worked closely with many stakeholders to identify the impact of their processes on the board's grease resistance and optimizing it.



### Value Received

- Optimized grease resistance at different levels; paperboard properties and converting operation
- Identified saving opportunities for obtaining the same performance while using less materials



# Hot Melt Gluing Issue

## Confidential

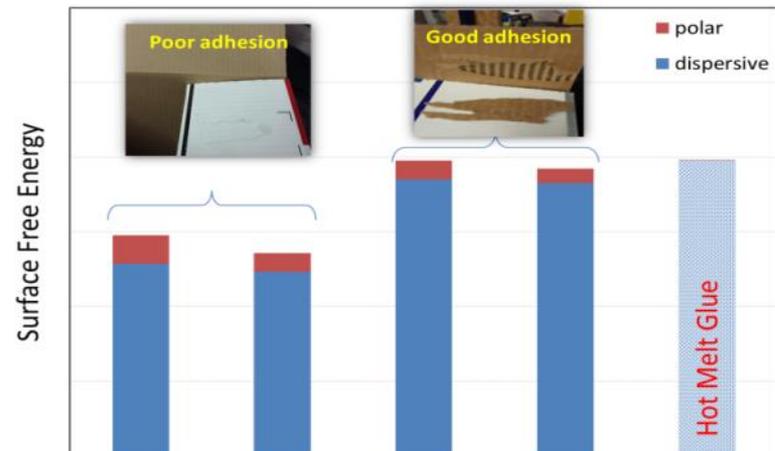
A mill contacted FPInnovations to address the hot melt gluing issue with boxes made with their linerboards. Poor hot melt glue adhesion to the inner liners resulted in several claims by one of their major customers.

### Approach

- Carried out detailed analysis of issue and samples collected by the customer including:
  - Contact angle to examine surface energy
  - Surface profilometry to evaluate micro-scale roughness
  - High resolution microscopy to examine sheet structure
- Identified the origin of the issue (in this case: surface chemistry)
- Performed similar analysis on trial samples produced by the mill

### Value Received

- The mill improved the chemistry of their board and as a result secured their business





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