

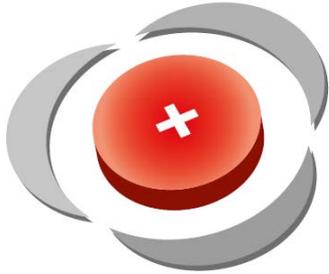
How to set tissue process on the track of Creping Excellence !

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CREPING EXCELLENCE

- People with passion for tissue making
- Committed to excellence in customer experience
- **Pioneer technology and customized productivity solutions**

Creping Excellence™ outcome

Example of BTG programs to gain quality and productivity

PL - **130'000€** - Production savings and chatter reduction

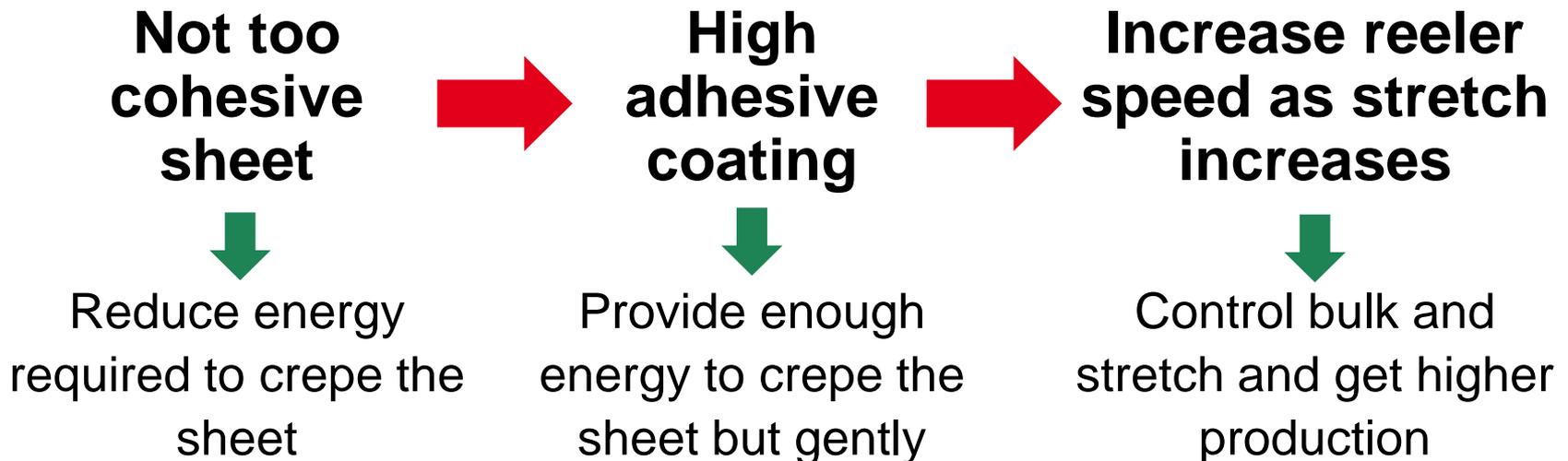
RO - **260'000€** - Project agreed with customer

BA - **390'000€** - Estimated savings from recommendations

BG - **1'000'000€** - On-going project

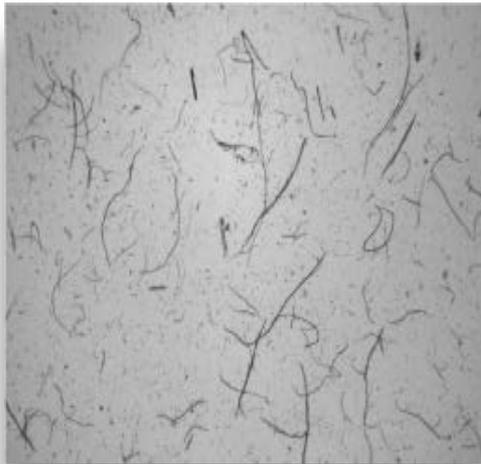
BTG Creping Excellence™

Align tissue manufacturing steps with industry best practices to enable development of highly resilient bulk/stretch at optimum productivity rate.

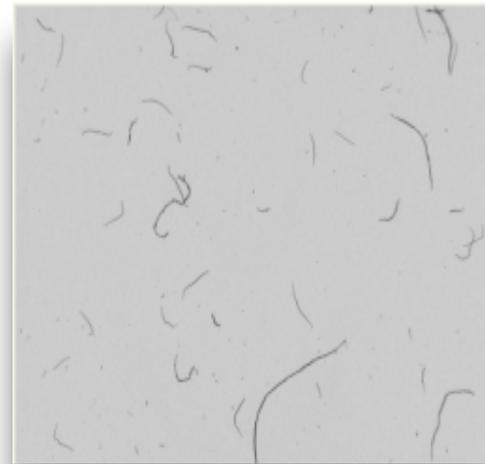


Over refining restricts bulk

- Heavily H-bonded sheet requires more energy to develop bulk and generates more fines
- Identified 200 k€ savings with smaller refiner plate



Over-refined fibers



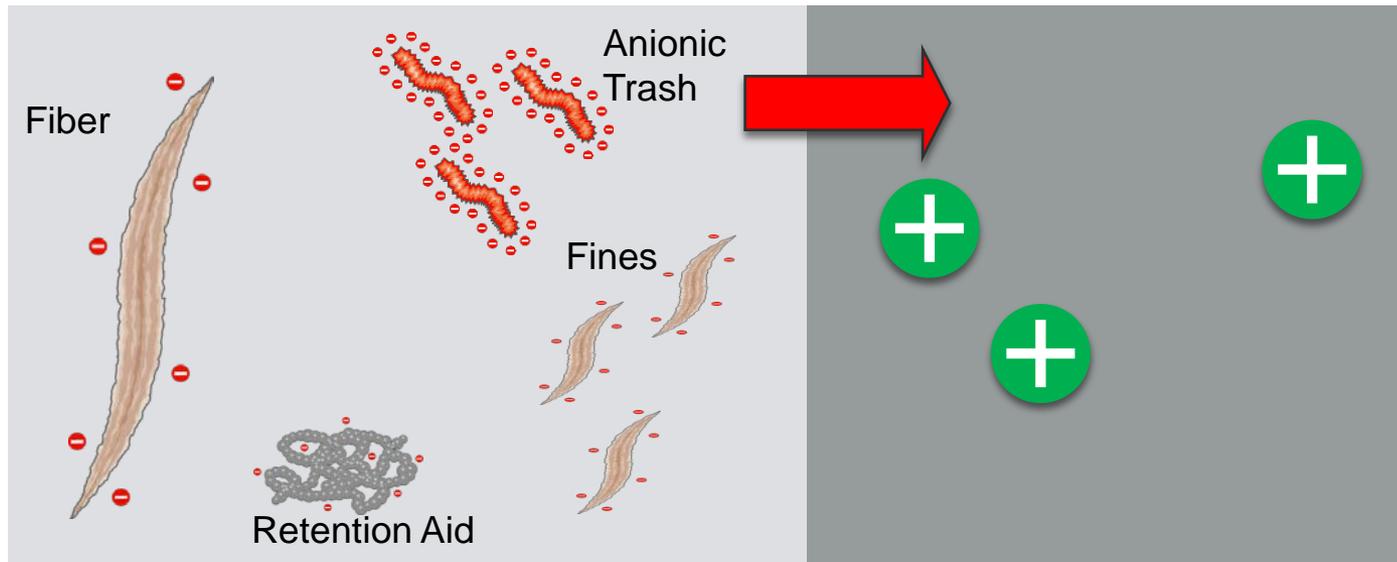
Correctly refined fibers

Compromized coating from wet end issue

- Coating is polluted with fines and anionic trash
- High white water consistency (WW)

Wet web

Coating and WW



Compromised
Yankee coating

Hard

Low bulk

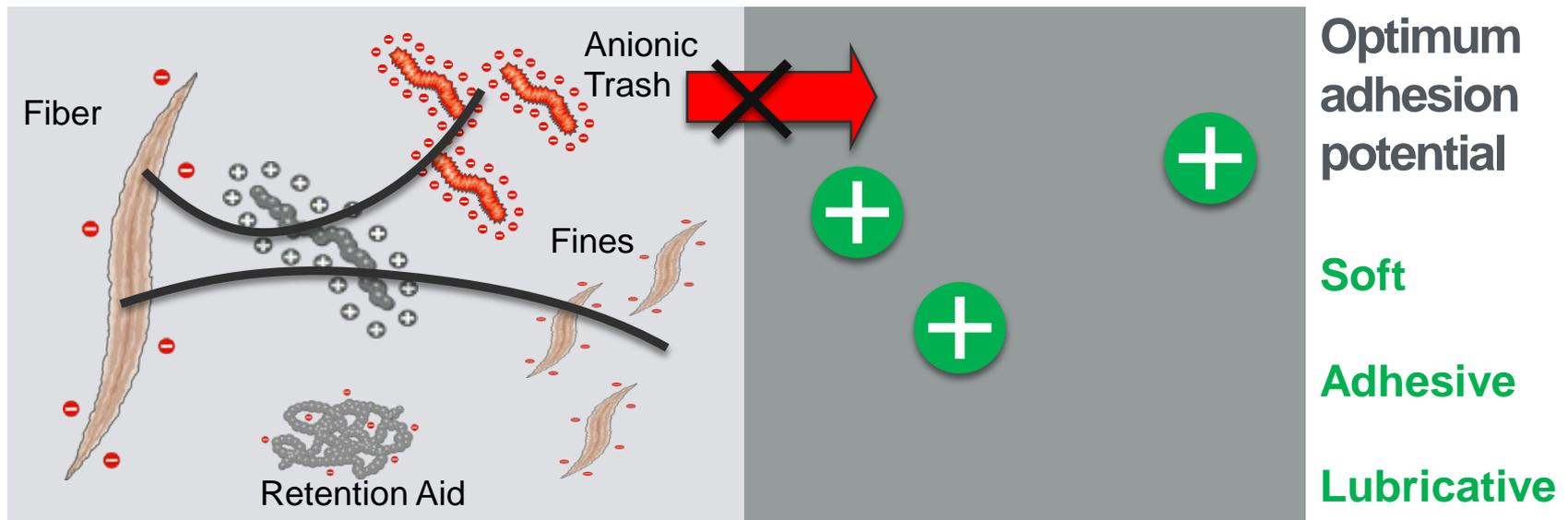
Vibrations

Optimum adhesion with controlled wet end

- Controlled fixative dosage keeps trash and fines in web
- Optimized DAF with sludge removed from the system

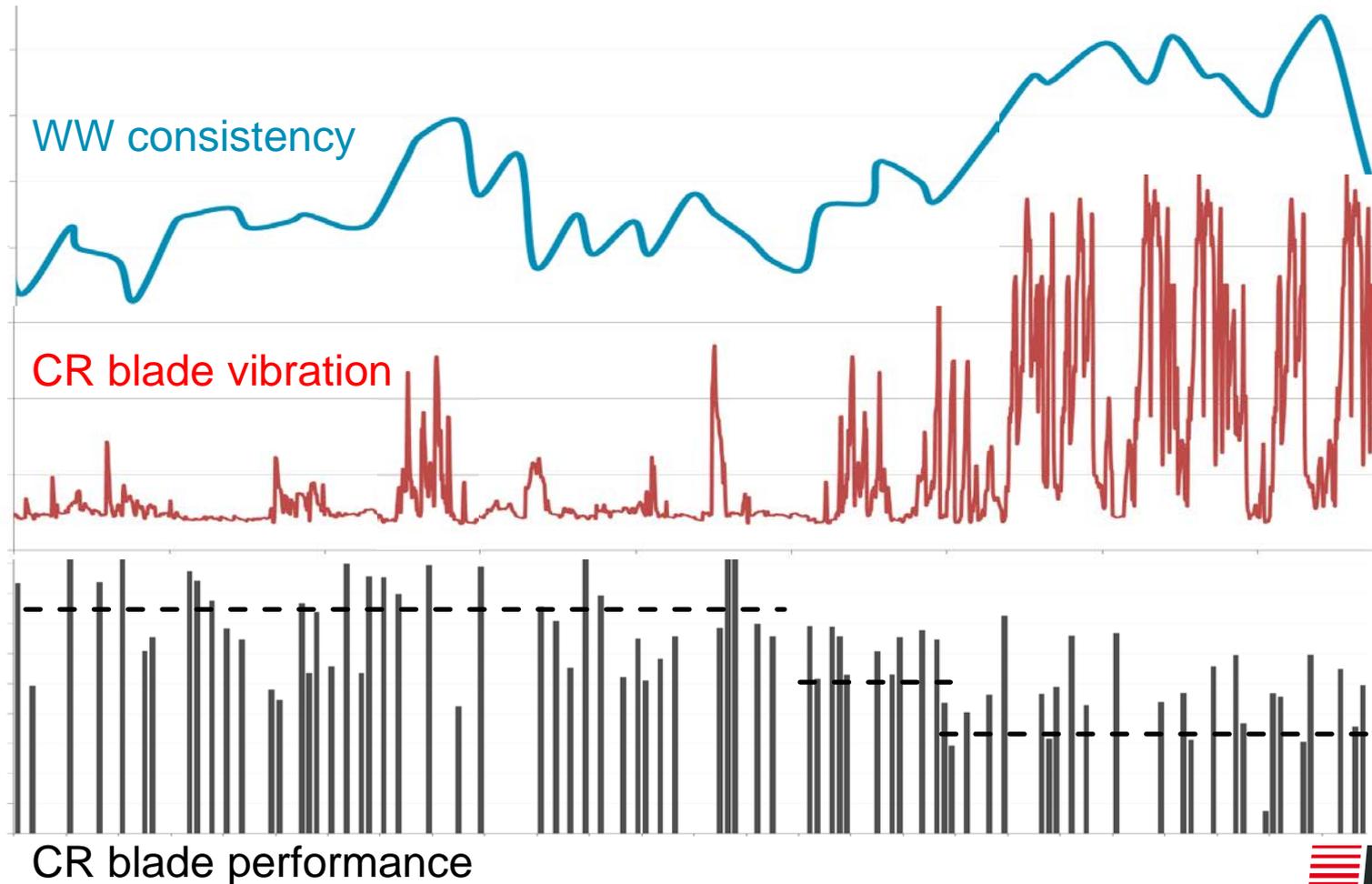
Wet web

Coating and WW



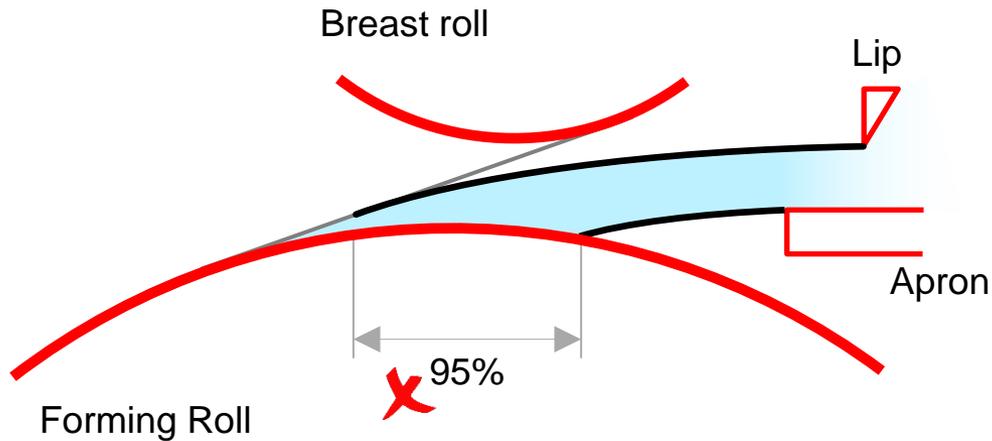
Effect of high water consistency

50-80 k€ losses and higher risks of chatter



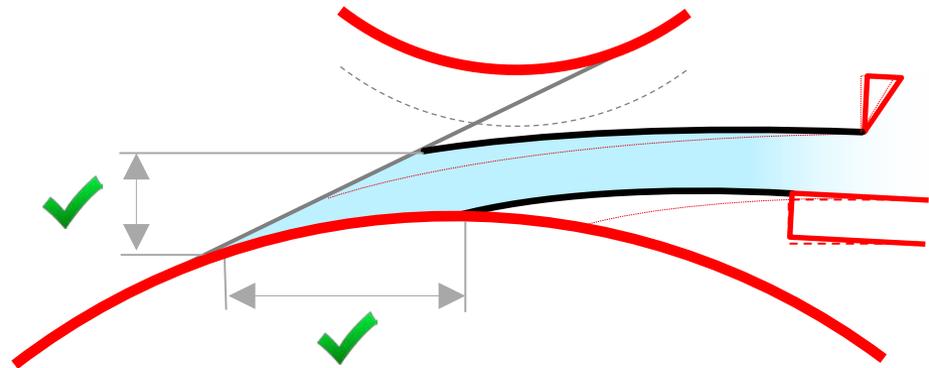
Formation

Wrong jet impingement compromises sheet cohesion



- Poor formation
- Wrong MD & MD/CD ratio
- Poor first pass retention

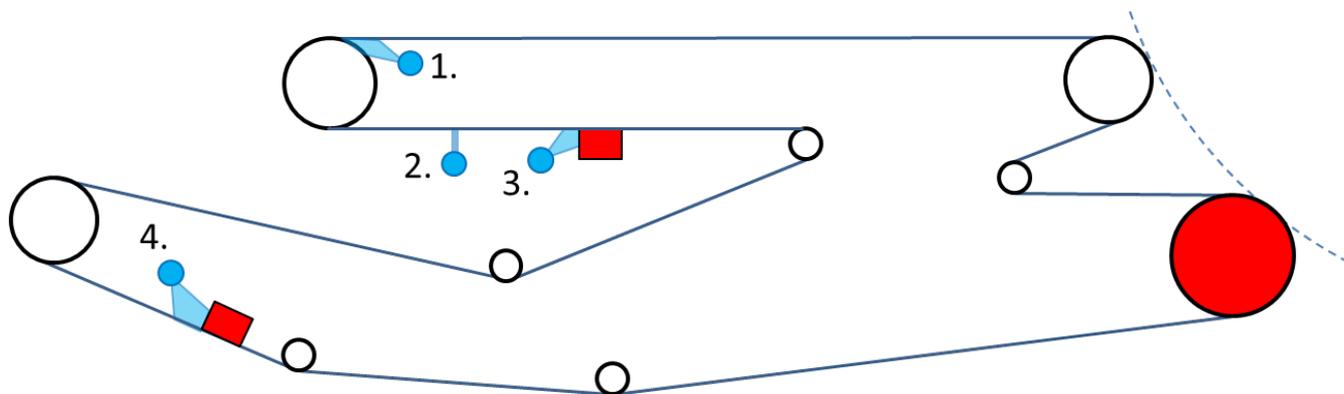
The solution →



Felt conditioning

- Low felt structure cleaning and premature change
- Low paper dewatering due to dry felt

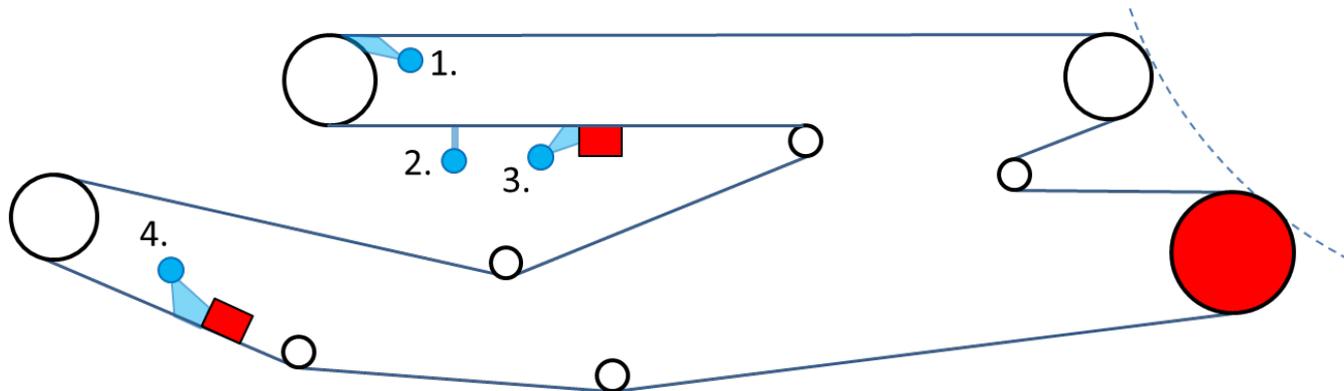
Pos.	Designation	Number of Nozzles (U)	Orifice diam. (mm)	Operating press. (bar)	Flow per nozzle (L/min)	Total flow (L/min)	
1	Flooding Nip Shower (FNS)	36	2.5	3	4.9	176	✗
2	Needle Shower (HPNS)	35	1	15	2.0	70	✓
3	Lube Shower (LS1)	36	2.5	3	4.9	176	✗
4	Pick-up (PU)	54	2.5	3	4.9	265	✗



BTG felt conditioning proposal

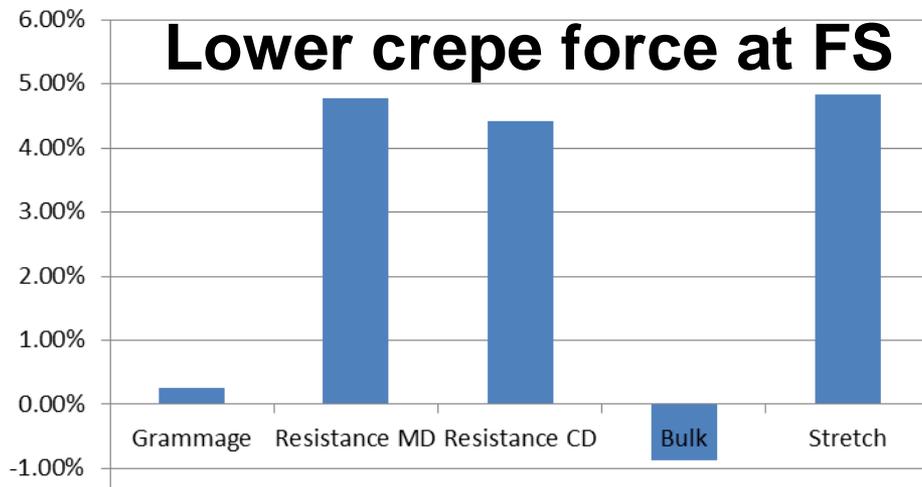
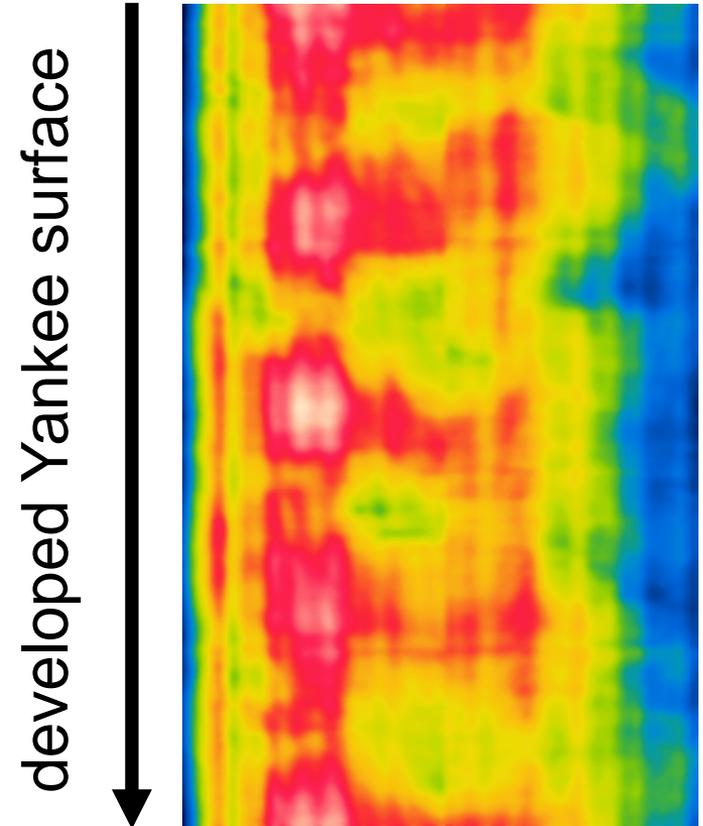
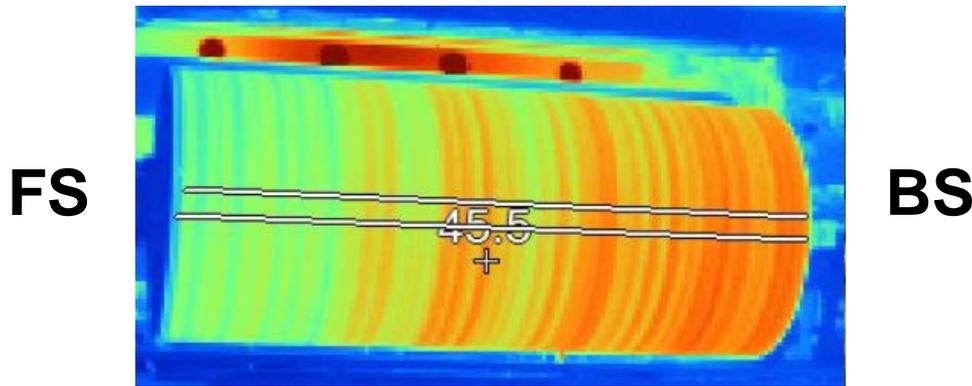
- Role of FNS back to normal – “Felt flooding”
- Post press drying improved and coating preserved

Pos.	Designation	Number of Nozzles (U)	Orifice diam. (mm)	Operating press. (bar)	Flow per nozzle (L/min)	Total flow (L/min)
1	Flooding Nip Shower (FNS)	36	5	3	19.4	698 ✓
2	Needle Shower (HPNS)	35	1	15	2.0	70 ✓
3	Lube Shower (LS1)	36	1.5	3	1.7	61 ✓
4	Pick-up (PU)	54	1.5	2	1.4	76 ✓

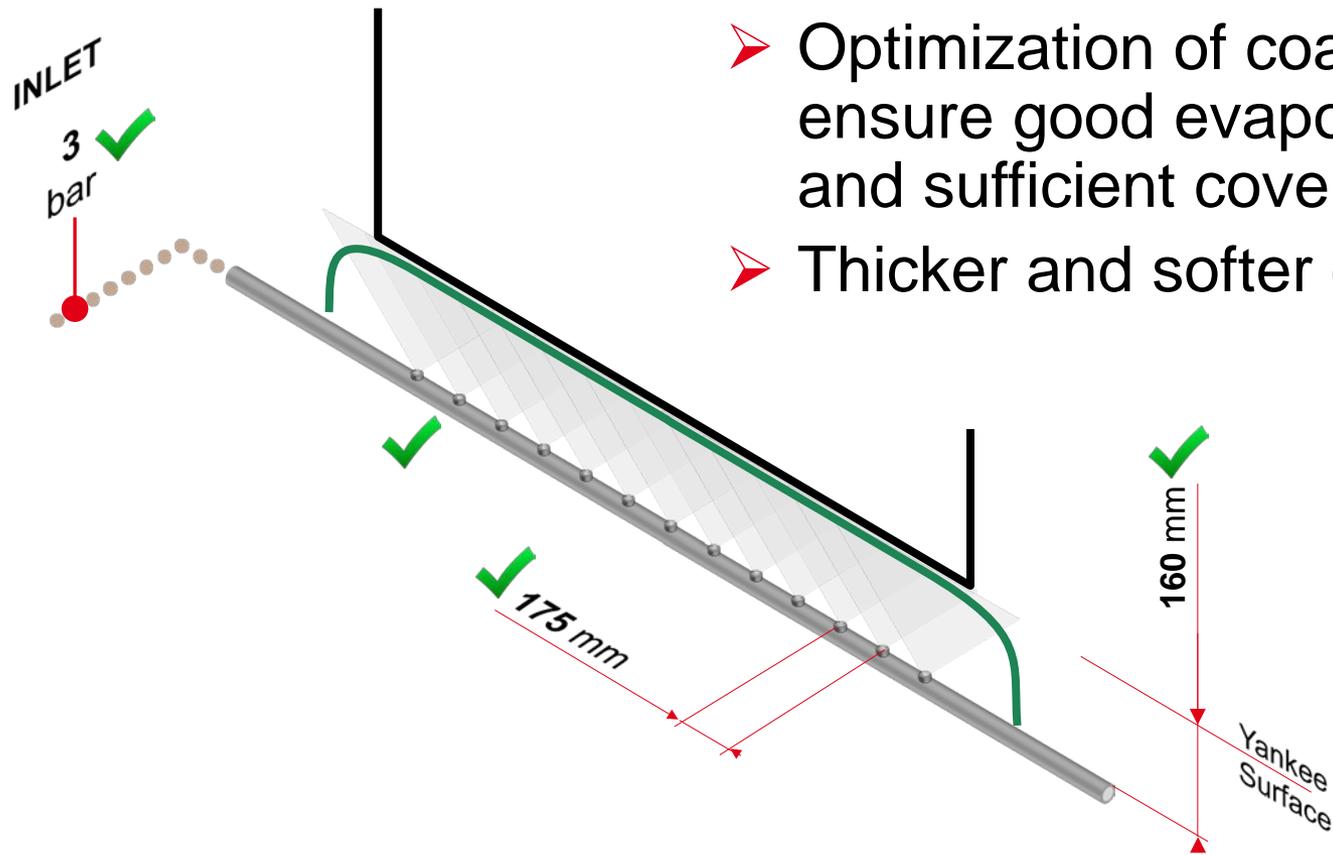


Obvious and hidden drying problems

Impacting coating and then tissue quality



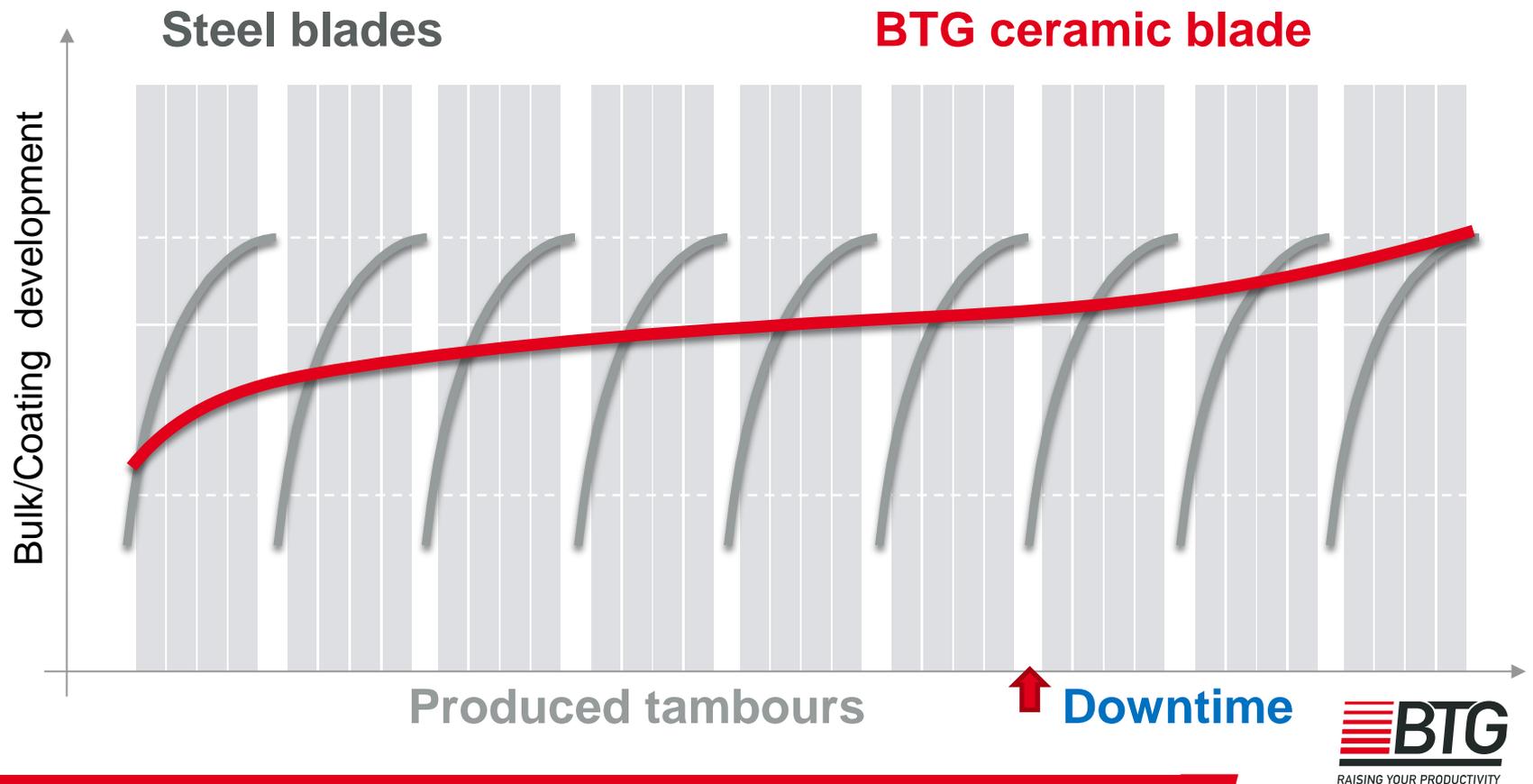
BTG coating spray bar proposal



- Optimization of coating volume to ensure good evaporative load and sufficient coverage
- Thicker and softer coating

Coating control with BTG blades

35-55 k€ downtime savings and improved tissue quality



Creping Efficiency

Major KPI to assess Excellence in tissue manufacturing

$$Ce (\%) = \frac{\text{Tissue Stretch (\%)}}{\frac{\text{Yankee Speed} - \text{Reeler Speed}}{\text{Reeler Speed}}}$$

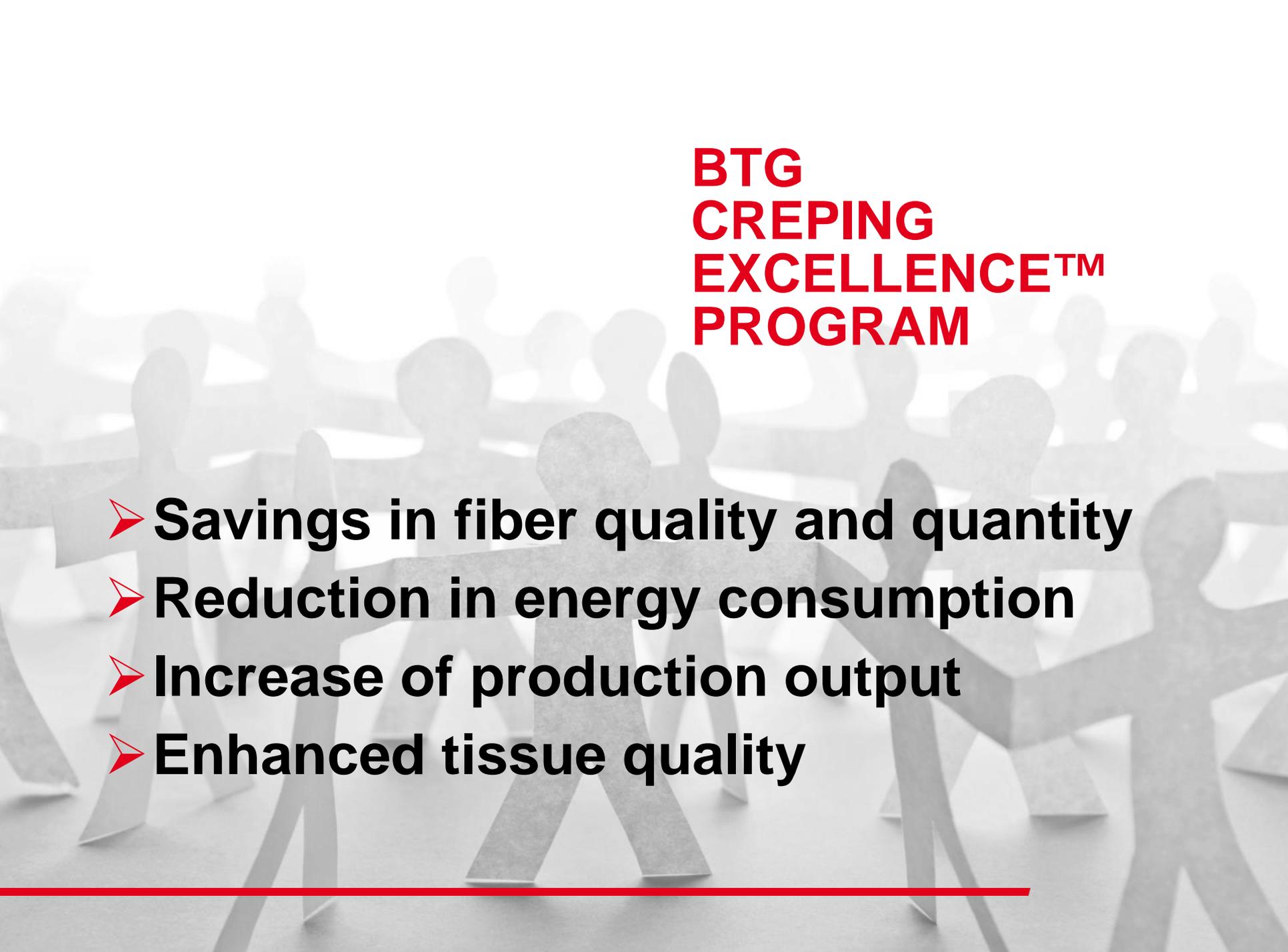
Consequences of low creping efficiency: $Ce < 90\%$

- Over-refined uncreped sheet
- Low wire weight
- High crepe ratio
- Difficult to develop resilient bulk

Creping Excellence™

Wrap up of steps to maximized quality and productivity

- Control sheet cohesion (fibre mix, refining, formation)
- Reduce coating contamination with wet end management
- Set up felt/wire conditioning to improve sheet presentation
- Eliminate dryer hot spots and streaks
- Ensure a uniform and adequate coating spray
- Take benefit from high performance blades features



BTG CREPING EXCELLENCE™ PROGRAM

- **Savings in fiber quality and quantity**
 - **Reduction in energy consumption**
 - **Increase of production output**
 - **Enhanced tissue quality**
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Thank you!

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