

FIBERCARE®
REFINING
CASE STUDY

Case Study 4

Refining Quality Improvement & Refining Energy
Reduction with FiberCare® on NCR Paper
Production at Mill 4

Trial Situation

Mill targets: Increase refining quality of hardwood

- Increase refined fiber quality
- Improve paper formation
- Reduce refining energy

Mill problem: Lower pulp quality of hardwood

Trial Situation

Paper grade: 40g/m² NCR base paper

Machine speed: 380m/min

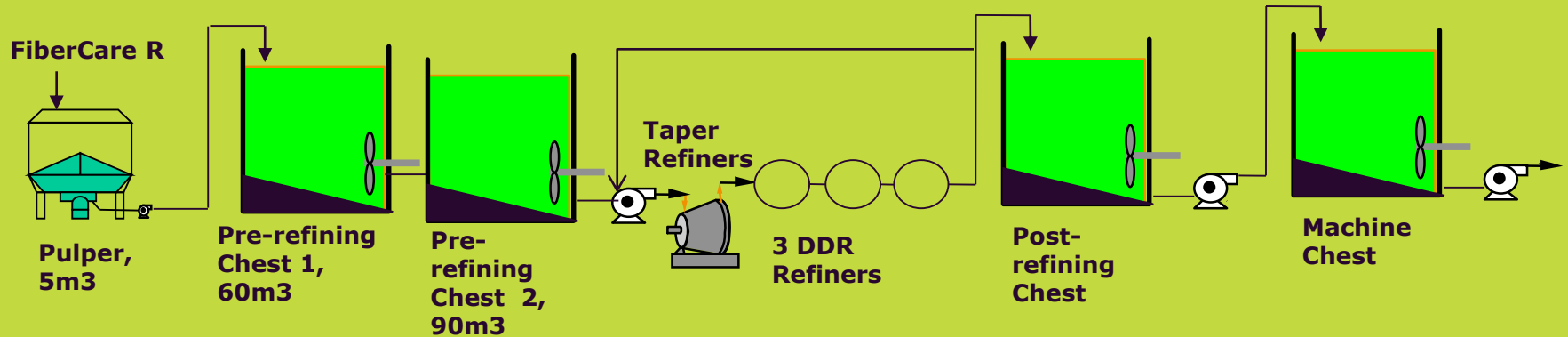
Furnish: 80% bleached hardwood kraft pulp / 20% bleached softwood kraft pulp

Enzyme treated pulp: Bleached hardwood kraft pulp

Pulp and white water situation:

- Pre-refiner Pulp : T = 44°C, pH = 6
- Post-refiner Pulp: T = 45°C, pH = 6
- White water: T = 36°C, pH = 6

Trial Situation



Enzyme: FiberCare R

Adding point: Pulper

Enzyme dosage: 100g/t

Enzyme treatment time: around 1.5-2 hours before refining

Trial Situation

Bleached hardwood kraft pulp refining

- Before refining: 20-21°SR , 2.1-2.3g
- After refining: 39-40°SR,
1.7-1.8g (wet weight)
- Refiners: 1 set of taper refiner + 3 sets of DDR refiners

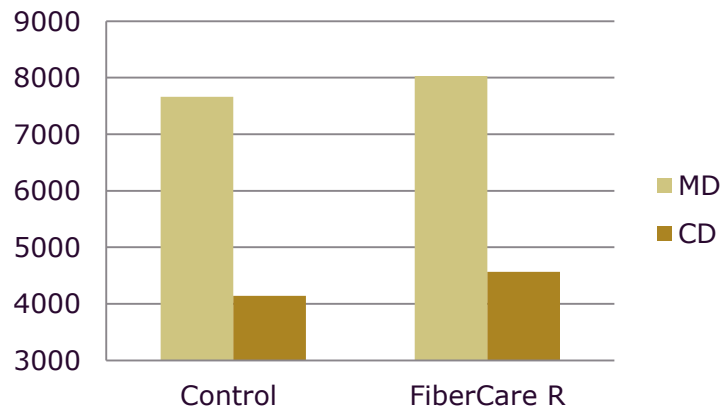
Trial Result-Refiners

	Pre-trial	FiberCare R
Taper refiner	100A	100A
1ST DDR refiner	170KW	X
2ND DDR refiner	255KW	290KW
3RD DDR refiner	280KW	300KW

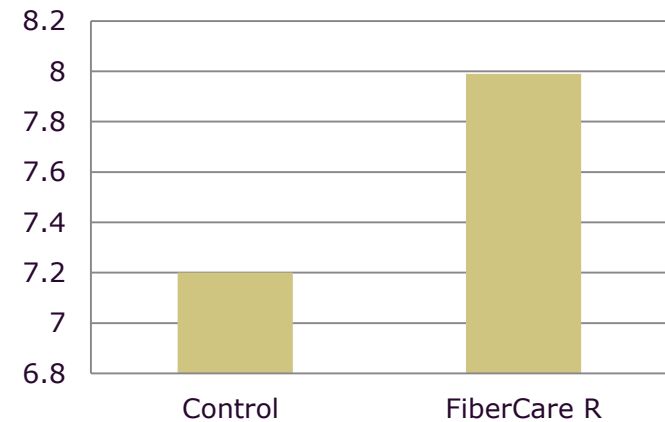
- Same refining pulp consistency: 3-4%
- Final refined pulp: 40°SR, 1.9g
- Save 23kwh/t dry pulp around

Trial Result-Strength & Ash content

Breaking length, m

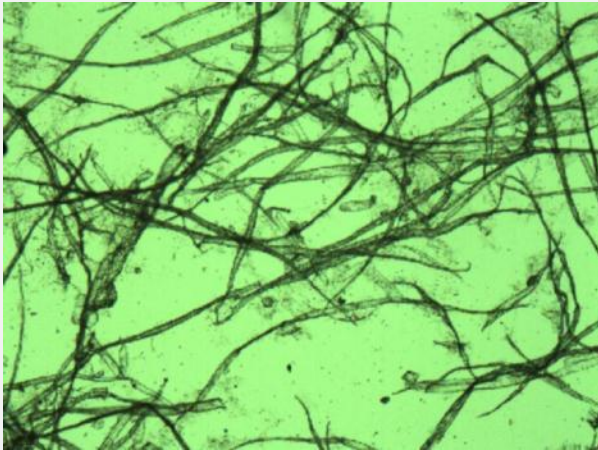


Paper ash content, %

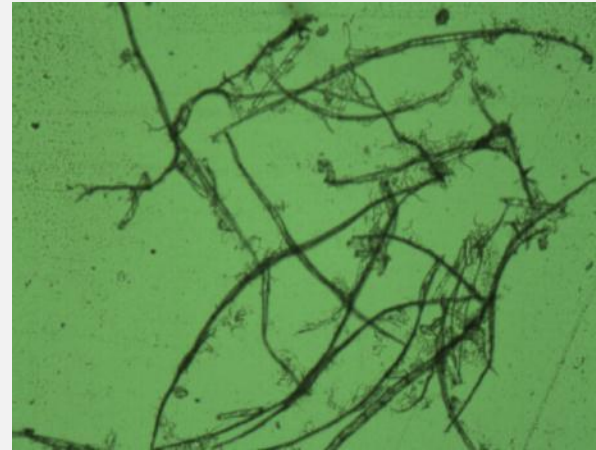


- FiberCare R: 0.1kg/t pulp
- Increased 4.8% tensile strength on MD and 10.2% on CD
- Paper ash content is increased by 0.79% (average from 7.2% to 7.99%)
- Paper formation is better

Trial Result-SEM



No enzyme (40°SR,1.9g)



FiberCare R (39°SR,1.82g)

- FiberCare R: 0.1kg/t pulp
- Fiber has swollen to become more “wider” and has better “fibrillation” after FiberCare R treatment
- Increased bonded area

Trial Conclusion

- FiberCare R 0.10kg/t hardwood pulp
- Saved 23kwh/t refining energy
- Increased 4.8% tensile strength on MD and 10.2% on CD
- Paper ash content is increased by 0.79%
- Paper formation is better

THANK YOU

