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Ph.D. Thesis (2023-2026)
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Compression refining an innovative process for reducing energy consumption in the papermaking industry

Raffinage par compression, un procédé innovant permettant de réduire la consommation énergétique de l'industrie papetière

Biochip / MatBio

Context

Environmental impact

- high energy consumption in the production of papers and cardboards
- a significant reduction in the energy consumption of the paper industry and associated greenhouse gas emissions

New process and material development

- process in order to reduce energy and water consumption
- main method to create newly improved materials serving specifying needs

Objectives

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- to evaluate the new technology
- the possibilities of the new strengthen development strategy to be implemented in the paper-making industry

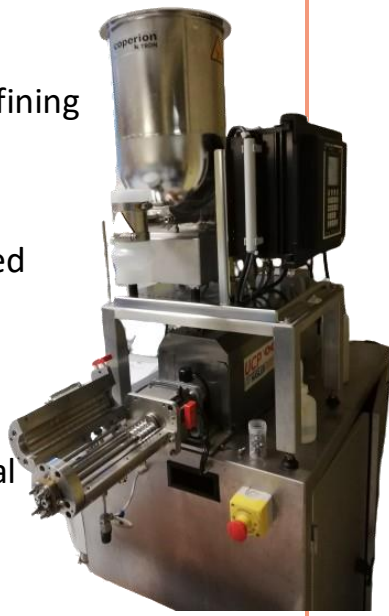
Tasks

- to estimate the potential gain for specific paper & board grades
- effects of compression refining on the kinetics of water elimination at each of the stages of consolidation of the fibrous mattress
- evaluation of energy consumption at each stage (refining, draining, pressing, drying)
- study the effect of compression refining on surfacing operations (size-press, coating)
- to estimate potential technological costs

Methods

Process

- Characterization of the experimental set-up of refining process with adjustable parameters resulting in specialized paper for varied purposes
- New process has to be compatible with the conventional technological processes



Investigations

- Effects of compression refining on fiber flexibility / flocculation, pressing and drying
- Effects of mixing temperature on pulp properties / energy requirement
- Forecasting mixing efficiency by modelling, measurement of pulp viscosity at high consistency

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