

Internship Offer for Engineer/Master 2 Student

Micro and Macroscopic Characterization of the Hygro-Mechanical Properties of Papers

Context:

Fibrous materials, such as paper, are considered a potential alternative to plastics but still face limitations in terms of basis weight and mechanical properties. This project aims to understand how to produce fibrous materials with improved inter-fiber bonding to achieve lighter, stronger, and more extensible bio-based materials.

To gain a comprehensive understanding of how the quality of inter-fiber bonds impacts the macroscopic properties of the final product, both macro- and microscopic analyses of these bonds are required. The proposed study focuses on the multi-scale characterization of the hygro-mechanical behavior of fibrous materials.

Objectives:

The goal of this internship is to characterize model papers at both the macroscopic and microscopic scales. The intern will be expected to conduct research to adapt existing methods to the project's specific needs. The intern's tasks will include producing papers from hardwood and softwood fibers at three different refining levels, using various manufacturing methods (vacuum drying, pressure drying, air drying, with or without pressing). These materials will then be characterized to determine their dimensional stability and hygro-mechanical properties (tensile testing under controlled humidity, Varidim, etc.). Very low basis weight papers will also be produced and analyzed to bridge the gap between different characterization scales. At the microscopic scale, an innovative tensile testing method using a DMA (Dynamic Mechanical Analysis) device will be employed to characterize fibers and inter-fiber bonds.

Candidate Profile:

- Student in the final year of an engineering school or Master's program in chemistry, materials science, or process engineering.
- Knowledge of paper manufacturing and characterization is desirable.
- A good level of English is a plus.
- Autonomy, curiosity, motivation, and the ability to work in a team are essential qualities for this internship.

Key Information:

- Location: LGP2 (Laboratory of Process Engineering for Biorefinery, Bio-Based Materials, and Printing), Grenoble campus (Saint-Martin-d'Hères), within the MatBio and BioChip teams.
- Duration: 5 to 6 months, starting February 2026.
- Compensation: According to current rates.

To apply, please send your CV and cover letter to:

CLAUZON Julien	julien.clauzon@lgp2.grenoble-inp.fr
Quentin Charlier	quentin.charlier@grenoble-inp.fr
Raphaël Passas	Raphael.Passas@grenoble-inp.fr

Application deadline: 01/12/2025
