InTechFibres
experts in plant chemistry

Presentation of the partnership, competences and facilities

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InTechFibres , a CTP-FCBA partnership

- **General information**

  - **InTechFibres** is the partnership combining the complementary skills of **CTP** (*French Pulp and Paper Research and Technical Institute*) **FCBA** (*French Institute of Technology for Forest-based and furniture sectors*) through:
    - ✓ CTP's InTechFibres Plant Chemistry Team
    - ✓ FCBA's InTechFibres Division
  - Partnership created in late 2004 and renewed in autumn 2014.
  - ~20 people from different educations (chemistry, pulp&paper, wood, biochemistry, physico-chemistry)
    - 2/3 are PhD engineers.

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- **Objectives**
  - To propose **expertise** in lignocellulosic materials for improving and/or modifying the industrial processes (pulps, panelboards, wood-based insulating materials, …)
  - To **innovate** in fibres production/utilisation and in biorefinery development.

Competences at your service

- Forestry management and wood logistics, including woodyard management
- Intra- and inter-tree variability of wood and pulp quality for softwoods and hardwoods
- Wood-Process and Process-Pulp relationships in terms of wood and pulp quality
- **Pulping** and **bleaching** processes (chemical, semi-chemical, high-yield processes)
- Panelboard processes (particles and fibres-based panelboards, insulating products)
- Lignocellulosic materials (wood and annual plants), fibres, pulp and panels characterisation
- Impact of wood species mixes in the manufacture of fibres
- Development of processes based on new technologies (bivis, ozone, biotechnologies, …)
- …



Competences at your service

- …
- Understanding of fibre separation mechanisms from wood matrix in different processes
- **Fractionation** and **cleaning** of fibres
- Impact of processes on the environment
- Extraction of molecules from lignocellulosics (green chemistry): hemicelluloses, bioactive molecules, lignin, …
- Functionalization/grafting onto lignocellulosic fibres in aqueous medium
- Manufacture of **micro- and nano-objects** from lignocellulosic materials



Lignocellulosics, a marvellous sustainable resource

- 340 MT biomasses for 180 MT Pulps (World)
- 29.4 Mm^3 Particleboards and 11.8 Mm^3 MDF (Europe)


- 45 % Cellulose (130 + 40 Mt)
- 25% Hemicelluloses (60 MT)
- 25% Lignins (60 MT)
- 5% Extractives (3 MT)

Lignins

Molecules for:
- Bio-energy
- Adhesives
- Dispersing agents
- Carbon fibres
- Carbon nanotubes
- Bitumen
- Active charcoal
- Bio-fuel
- bio-gas
- Polymers
- Textiles fibres

Extractives

Molecules for:
- Rubber
- Pharmaceutics
- Cosmetics
- Perfumes
- Inks
- Adhesives
- Conservation
- Nutraceutics
- Insulating foams

Hemicelluloses

Molecules for:
- Paper strengthening
- Refining
- Organic charges
- Hybrid charges
- Surface active agents
- Bio-sourced polymers
- Barrier packagings
- Bio-fuel
- Bio-gas
- Printed electronics
- Textile fibres

Cellulose


Molecule for :
- Acetate
- Viscose
- Food Excipients
- Food additives
- Bio-fuel

Fibres for:
- Papers-Boards
- Panelboards
- Insulating products
- Composites

MFC for:
- Papers-Boards
- Health vectors
- Thickeners
- Composites

Laboratory and pilot facilities

- Laboratory facilities to simulate **chemical pulping and bleaching** processes at different scales
- **Extraction** pilot
- Refiner **Mechanical Pulping** and **Fibreboard** Pilots
- **Fibre Modification** Pilot
- Screening System
- Low Consistency **Refining** Pilots
- Heated Hydraulic **Press** for panelboards
- **Lignin** Production Platform
- **NaMiCell** Pilot (MFC)



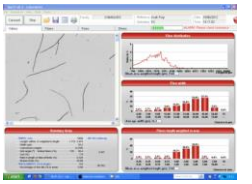
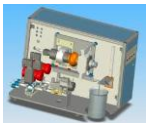
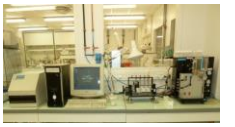







Lignocellulsic materials characterisation

- Wood characterisation
- Image based analysers
  - Cyberflex, Cybersize, Cyberbond
  - MorFi (labo and mobile units)
  - MorFi Wall Thickness
- Analytical tools for fibre components analysis
- Optical and scanning electron microscopes TEM, SEM, ESEM
- Immuno-labelling technique
- Chemical characterisation

Chemical Characterisation

- **Lignin** extraction by acidolysis and by enzymatic dissolution of carbohydrates
- **Lignin** structure analysis by ^{13}C NMR and ^{19}F NMR
- Molecular weight distribution of lignin (GPC) and cellulose
- Functional groups on cellulose (carbonyl, carboxyl)
- **Sugar** analysis of lignocellulosics
- GC-Mass spectrometry
- Pyrolysis of lignocellulosics
- HPLC analysis with various detectors
- Ionic chromatography, electrophoresis
- Near InfraRed spectrometry

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A **team of experts**
for your specific needs…
competences and facilities
at your service