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Ph.D. thesis (2024-2027)
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Set-up of an innovative wood-based biocomposite for processing by 3D LDM printing and wood panel adhesion

Elaboration d'un biocomposite innovant à base de bois et développement de sa mise en forme par procédés d'impression 3D LDM et thermopressage

FunPrint

Context

Substitution of Phenol-Formaldehyde Resins

- Widely spread polymer.
- Formaldehyde in the resin : SVHC.
- Imperative need of a bio-based, non toxic replacement.

Applications targeted :

Wood based panels
- Used in furniture and construction
- Production volume doubled in 20 years

3D printing
- Disrupting technology
- Broad range of techniques and applications
- Market doubled in 6 years
- Large-scale 3D printing in progress

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Objectives

To replace phenol formaldehyde resins by fully bio-based ones

- Bio-based phenols : Lignin, tannins…
- Bio-based dialdehydes : HMF, furfural…

To increase the commercial value of lignin products

- By creating new sustainable and non-toxic biomaterials.
- By developing new applications for lignin in wood-based panel and as an additive for 3D printing.

To produce demonstrators

- 5m² of wood panels made from 100 % bio-based adhesives.
- > 100 printed objects produced with 3D printing with more than 50 % bio-based resin.

Methods