



Khaoula BOUZIDI

Post-doc (2022-2023)

LGP2 (May 2022; Nov 2023)

ThermoBioComp3D- Bio-based composite with high performances for 3D printing and molding

ThermoBioComp3D- Composite biosourcé à hautes performances pour l'impression 3D et moulage

lgp²

Context

Bio-based composites

Today, the substitution of oil-based materials represents a major environmental and industrial challenge.



3D printing

is a revolutionary and green manufacturing technology:

- low material loss;
- easy cost-effective product customization;
- one machine → infinity of objects.

→ BUT need to develop more bio-based materials especially composites.

3D-Papel project (2018-2021)



The project 3D-Papel allowed the development of a 100% bio-based composite for 3D printing. The bio-composite presented high thermomechanical properties which triggered the interest of many industrials.

Funded and accompanied by:



Objectives

General objective



- Industrialize the process and transfer the patented technology to industrials.

3D Printing *in situ*



- Curing the composite while printing
- Printing more complex objects
- Industrialize the printing process

Injection/Compression molding



- Manufacture pellets out of the pasty composite precursor
- Manufacture of technical pieces without porosity
- Increase the manufacturing cadence

Exhaustive composite characterization

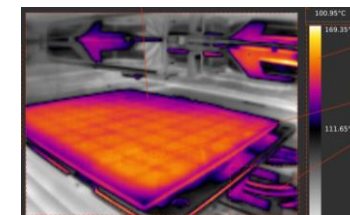


- High thermomechanical properties
- Mechanical properties as high as PEEK
- Good fire resistance

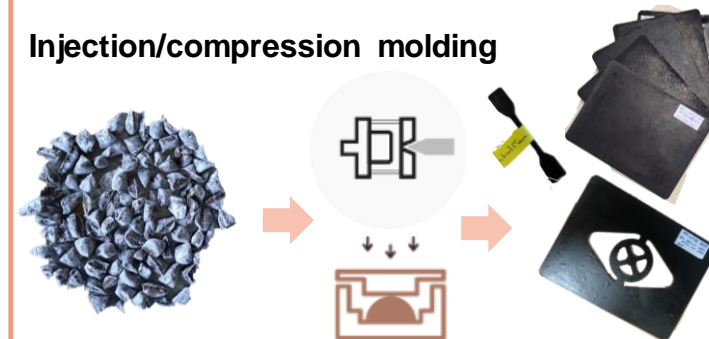
Methods

3D Printing *In situ*

- Use of codeveloped 3D-Printer with LDM printing head and heated chamber for an *in situ* curing while printing.



Injection/compression molding



Patent:

Beneventi, D., Chaussy, D., Bouzidi, K., Gandini, A., 2021.

Publications:

Bouzidi, K., Chaussy, D., Gandini, A., Bongiovanni, R., Beneventi, D., 2022.. Carbohydrate Polymers 293, 119716. 6

Bouzidi, Khaoula, Chaussy, D., Gandini, A., Flahaut, E., Bongiovanni, R., Beneventi, D., 2022. Composites Science and Technology 230, 109765.

