Deliverable n°2.1.1

Model composite laminates produced from the prototypes of the non-woven

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Content

- Objectives:

The main objective of this deliverable is to produce composite plates from the first flax-PLA preforms produced on the prototype carding machine developed by Ecotechnilin. These tests will validate the feasibility and the quality of the first webs produced for a future application as composite materials.

- Materials:

A set of light preforms are targeted with the following technical specificities:

Samples	Flax (wt-%)	PLA (wt-%)	Targeted areal weight (g/m²)
1	0	100	80-100
2	10	90	80-100
3	30	70	80-100
4	50	50	80-100
5	70	30	80-100

- Preforms manufacturing:

Flax-PLA preforms were produced using the protype of carding system developed by Ecotechnilin, according to Figure 1:

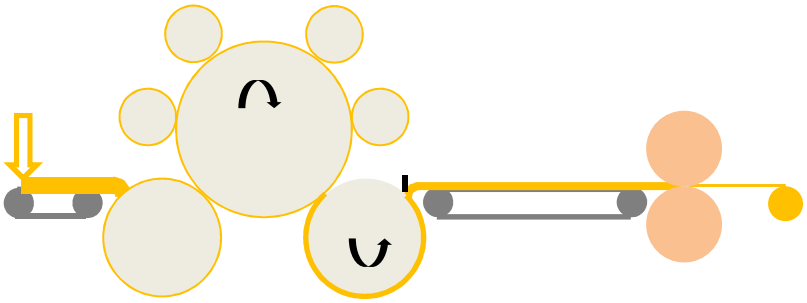

Figure 1 – Scheme of the carding prototype

➢ Composites manufacturing:

Flax-PLA composites plates were produced by hot compression moulding according to the following Figure 2:

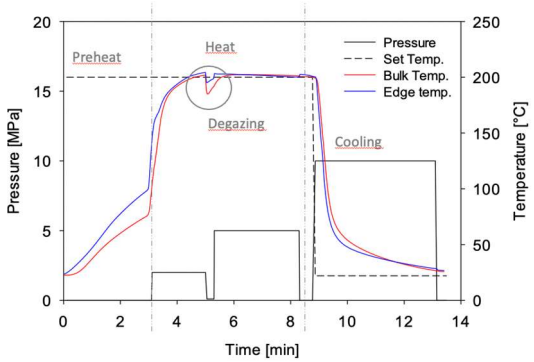

Figure 2 – Compression cycle for plates manufacturing

An average thickness of 2 mm was targeted, representing 16 layers of flax-PLA preforms. Preforms were stacked in the fibre direction and then compressed at 200°c with a pressure of 5 MPa.

Figure 3 shows examples of composite plates.

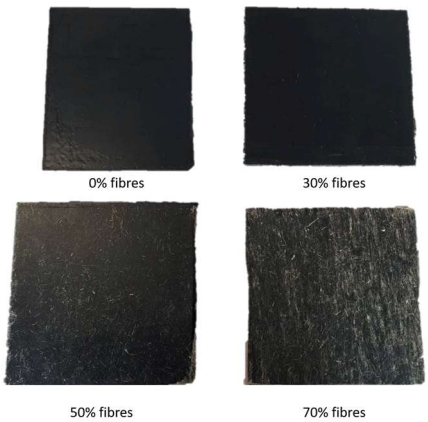

Figure 3 – Plates obtained with different PLA-Flax ratios

Conclusion

This work demonstrated the feasibility of producing PLA-flax non-woven preforms on the prototype machine line developed by Ecotechnilin. These are suitable for the manufacturing of thermo-compressed composite materials. Plates with variable fibre and polymer fractions could be produced. In the following deliverables (2.1.2); their mechanical and morphological characteristics will be studied.